Vol. XVII Formerly CONSERVATION No. 3

American Forestry

MARCH 1911

THE PEOPLE'S POSSESSIONS IN THE APPALACHIAN FORESTS
By THOMAS NELSON PAGE

THE PASSAGE OF THE APPALACHIAN BILL

HARVESTING THE ANNUAL SEED CROP
By SYDNEY MOORE

GROWING TREES FROM SEED
By C. R. PETTIS

REFORESTATION IN MASSACHUSETTS
By F. W. RANE

THE COMMISSIONER OF CORPORATIONS' REPORT ON STANDING TIMBER

EDITORIALS
and
DEPARTMENTS

Published by THE AMERICAN FORESTRY ASSOCIATION, 1410 H St., N. W., Washington, D. C.
Price $2.00 per Year. Copyright 1910, by the American Forestry Association

EVERGREEN and FOREST TREES
SEEDLINGS and TRANSPLANTS
Also SEEDS for FOREST PLANTING

Immense quantities of following hardy valuable sorts: White Pine, Scotch Pine, Ponderosa Pine, Jack Pine, Austrian Pine, Douglas Fir, Balsam Fir, Norway Spruce, White Spruce, Red Spruce, Hemlock, etc., etc.

DECIDUOUS TREES

Larch, Beech, Birch, Maple, Ash, Walnut, Locust, Elm, Oaks, Catalpa Speciosa, Wild Cherry, Linden, etc., etc.

Tree Seeds—Guaranteed New Crop

A complete assortment of all valuable species, both native and foreign. High *germination* quality.

Write for Prices — Mention this Magazine

THE D. HILL NURSERY COMPANY

Evergreen Specialist — Largest Grower in America

Founded 1859 — DUNDEE, ILL.

A VALUABLE RECORD

of the progress and relations of forestry in America is contained in the PROCEEDINGS OF THE AMERICAN FOREST CONGRESS OF 1905 which was published by the American Forestry Association. A limited number of the edition remains and the book

WILL NOT BE REPRINTED

Every public library should have this volume; every person who is interested in forestry and who does not now own one should avail himself of the opportunity to secure a copy before the edition is disposed of.

The price is $1.50 postpaid.

This offer which was originally limited to Jan. 1, has been extended to April 1, 1911

	Regular Price
Membership in American Forestry Association	$1.00
Subscription to AMERICAN FORESTRY to January, 1912	2.00
Proceedings of American Forest Congress	1.50
The whole for $3.25	$4.50

THE AMERICAN FORESTRY ASSOCIATION

MARYLAND BUILDING

1410 H STREET NORTHWEST — WASHINGTON, D. C.

The American Forestry Association

OFFICERS FOR 1911

President

CURTIS GUILD, Jr., Massachusetts

Vice-Presidents

JOSHUA L. BAILY, Pennsylvania
CHARLES W. ELIOT, Massachusetts
B. E. FERNOW, Ontario, Canada
W. W. FINLEY, District of Columbia
DAVID R. FRANCIS, Missouri
RUTHERFORD P. HAYES, North Carolina
GEORGE FOSTER PEABODY, New York
J. E. RANSDELL, Louisiana
J. T. ROTHROCK, Pennsylvania
ALBERT SHAW, New York

Executive Secretary

EDWIN A. START, 1410 H Street N. W., Washington, D. C.

Treasurer

OTTO LUEBKERT, Washington, D. C.

Directors

ROBERT P. BASS, New Hampshire
H. H. CHAPMAN, Connecticut
CURTIS GUILD, Jr., Massachusetts
AUSTIN F. HAWES, Vermont
JOHN E. A. HUSSEY, Massachusetts
OTTO LUEBKERT, District of Columbia
CHESTER W. LYMAN, New York
GEORGE H. MAXWELL, Illinois
CHARLES LATHROP PACK, Ohio
THOMAS NELSON PAGE, District of Columbia
CHARLES F. QUINCY, New York
CUNO H. RUDOLPH, District of Columbia
ERNEST A. STERLING, Pennsylvania
FREDERICK S. UNDERHILL, Pennsylvania
ROBERT S. WOODWARD, District of Columbia

Advisory Board, Representing Affiliated Organizations

Yellow Pine Manufacturers' Association

JOHN L. KAUL, Birmingham, Ala.
N. W. McLEOD, St. Louis, Mo.
H. H. WHELESS, Shreveport, La.

National Wholesale Lumber Dealers' Association

ROBT. C. LIPPINCOTT, Philadelphia, Pa.
LEWIS DILL, Baltimore, Md.
R. M. CARRIER, Sardis, Miss.

Northern Pine Manufacturers' Association

C. A. SMITH, Minneapolis, Minn.
WILLIAM IRVINE, Chippewa Falls, Wis.
F. E. WEYERHAEUSER, St. Paul, Minn.

Massachusetts Forestry Association

NATHANIEL T. KIDDER, Milton, Mass.
FREDERIC J. CAULKINS, Boston
IRVING T. GUILD, Arlington, Mass.

Lumbermen's Exchange

WILLIAM L. RICE, Philadelphia, Pa.
FREDERICK S. UNDERHILL, Philadelphia, Pa.
SAMUEL B. VROOMAN, Philadelphia, Pa.

National Slack Cooperage Manufacturers' Association

J. T. WYLIE, Saginaw, Mich.
JAMES INNES, Chatham, Ontario
A. H. WELLES, Standish, Mich.

National Association of Box Manufacturers

B. W. PORTER, Greenfield, Mass.
S. B. ANDERSON, Memphis, Tenn.
ROBT. A. JOHNSON, Minneapolis, Minn.

Carriage Builders' National Association

H. C. McLEAR, Wilmington, Del.
D. T. WILSON, New York.
C. D. FIRESTONE, Columbus, Ohio

Boston Paper Trade Association

N. M. JONES, Lincoln, Maine
JOHN E. A. HUSSEY, Boston, Mass.
ARTHUR L. HOBSON, Boston, Mass.

Philadelphia Wholesale Lumber Dealers' Association

R. G. KAY, Philadelphia, Pa.
J. RANDALL WILLIAMS, JR., Philadelphia, Pa.
B. FRANKLIN BETTS, Philadelphia, Pa.

APPLICATION FOR MEMBERSHIP

Date.....

THE AMERICAN FORESTRY ASSOCIATION
1410 H Street, Washington, D. C.

Dear Sir: I hereby signify my desire to become
- **an Annual Member ($1)**
- **a Contributing Member ($10)**
- **a Sustaining Member ($25)**
- **a Life Member ($100)**
- **a Patron ($1,000)**

of the AMERICAN FORESTRY ASSOCIATION, and enclose $.....for dues.

Very truly yours,

Name.....

P. O. Address.....

For subscription to AMERICAN FORESTRY enclose $2 additional and sign here.....

AMERICAN FORESTRY ASSOCIATION

BOOK SALES DEPARTMENT

This department is conducted by the Association for the convenience of its members and of the subscribers to AMERICAN FORESTRY. We will obtain upon order any book on forestry or related subjects at its list price.

Orders should be accompanied by remittance in draft, postal, or express order.

We will give any information that we can as to the character of books wanted but we can assume no responsibility for their giving satisfaction. As we order books from the publishers and do not carry them in stock no exchanges can be made.

The numerous and valuable publications of the Forest Service of the United States Department of Agriculture are distributed free or at nominal cost and application should be made for them direct to the Department, which will furnish a list of those available.

The lists below are not complete, but include some of the most useful books. Titles of other books on forestry and allied subjects will be published later and lists can be furnished on request.

PRINCIPLES AND PRACTICE OF FORESTRY.

MANUAL OF FORESTRY. (Schlich) Translated from the German. Five volumes, complete, or separately, as follows (*price, complete, $18.80*):

Vol. I. "FORESTRY POLICY IN THE BRITISH EMPIRE." *Price, $2.40*

Vol. II. "SYLVICULTURE." *Price, $3.20*

Vol. III. "FOREST MANAGEMENT." *Price, $3.60*

Vol. IV. "FOREST PROTECTION." *Price, $4.80*

Vol. V. "FOREST UTILIZATION." *Price, $4.80*

This is perhaps the most authoritative work that has been issued on the technical side of forestry.

PRINCIPLES OF AMERICAN FORESTRY. By SAMUEL B. GREEN. Prepared especially for students in elementary forestry and for the general reader who wishes to secure a general idea of forestry in North America. *Price, $1.50*

FOREST MENSURATION. By HENRY SOLON GRAVES, M. A. A complete text book of this important subject and the first written for American foresters. It deals with the determination of the volume of log, tree, or stand, and with the study of increments and yields. *Price, $4.00*

ECONOMICS OF FORESTRY, THE. By B. E. FERNOW. This volume treats of forests and forestry from the standpoint of political economy, and is designed to furnish a trustworthy basis for formulating public policy. *Price, $1.50*

FIRST BOOK OF FORESTRY, A. By FILIBERT ROTH. An outline of the general principles of forestry, written in simple, non-technical language, designed particularly for the beginner. *Price, 90c.*.

PRACTICAL FORESTRY FOR BEGINNERS IN FORESTRY, AGRICULTURAL STUDENTS, AND WOODLAND OWNERS. By JOHN GIFFORD. A good general description of the principles of forestry with enough technical information to prepare the beginner. *Price, $1.20*

HISTORY OF THE LUMBER INDUSTRY OF AMERICA. By J. E. DEFEBAUGH. The first authoritative work of its kind yet issued, and one which will commend itself alike to the timber owner, lumberman, lumber manufacturer, or merchant, or student of economics. To be completed in four volumes bound in half leather. Only two vlumes have been published. *$5.00 per volume.*

FOREST MANAGEMENT, 75 cents; *Forest Mensuration*, $1.25; *Forest Finance*, $1.25; *Forest Protection*, $1.75. Four outlines, bound in paper, of lectures by DR. C. A. SCHENK, Director of the Biltmore Forest School.

TREES AND WOODS.

MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico). By CHARLES SPRAGUE SARGENT. A volume that presents in convenient form and with excellent illustrations, authoritative information concerning the trees of North America. *Price, $6.00*

AMERICAN WOODS. By ROMEYN B. HOUGH. A new departure in the publication of an authoritative work illustrated with actual wood sections of the various species described. Three are given of each, viz.: radial, transverse, and tangential. Issued in ten parts. *Price, per part, $5.00*

THE TREE BOOK. By JULIA E. ROGERS. Good description, with comprehensive accounts of habits and uses. Fully illustrated with photographic half-tones. *Price, cloth, $4.00*

HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS. By ROMEYN B. HOUGH. Pictorial description of trees. Two pages to each species; photo-engravings of trunk, leaves, flowers or fruit, section of wood, and map of distribution, with botanical description, and brief other information.
Price, in buckram, $8.00; in half morocco, $10.00.

FLORA OF THE SOUTHERN STATES. CHAPMAN. This is an excellent key to the flora of the South, complete and accurate in its scope. *Price, $4.00*

GETTING ACQUAINTED WITH THE TREES. By J. HORACE MCFARLAND. A handsome volume, copiously illustrated, and with facts accurately presented in an entertaining way. *Price, $1.75*

HOW PLANTS GROW. By ASA GRAY. An understanding of the way in which a tree grows is of prime importance to the forester, and the matter here presented is accurate and authoritative. *Price, 80c*

PRINCIPAL SPECIES OF WOOD; THEIR CHARACTERISTIC PROPERTIES. By CHARLES HENRY SNOW. No attempt is made to give exhaustive descriptions of species, but the author presents a mass of information designed for the use and instruction of woodworkers, etc., in a popular style. *Price, $3.50*

OUR NATIVE TREES. By HARRIET L. KEELER. A manual of description and identification for the amateur botanist and tree lover. Pp. 533.
Price, cloth, $2.00

THE CARE OF SHADE TREES. By B. E. FERNOW. A manual for city and town officers and others having the care of private or public shade trees, with a useful list of species. Pp. 392.
Price, cloth, $2.00

WOOD. By G. S. BOULGER. An imporant new book for arboriculturists and forestry students. A manual of the natural history and industrial applications of the timbers of commerce. Cloth. 82 Illustrations. *Price, $4.20*

FAMILIAR TREES. By Prof. G. S. BOUGLER. Written by an eminent botanical authority, yet couched in language easily understood. The coloured plates are the work of celebrated artists, and are truthful and trustworthy in every respect. A special feature is the series of photo-micrographic illustrations of sections of woods. Three volumes.
Price. per volume, $1.50

MANUAL OF BOTANY. By ASA GRAY. A key to the flora of the northeastern states and the most authoritative publication of its nature. Seventh Edition.
Price, Cloth, 8vo, $2.50
Tourist's Edition, flexible leather, $3.00

TREES OF NEW ENGLAND. By L. L. DAME and HENRY BROOKS. This book is a small volume which can be easily put in the pocket and carried in the woods, and at the same time is the best guide to the identification of our New England trees of any of the smaller books yet published. *Price, $1.50*

TREES AND SHRUBS. By C. S. SARGENT. The most thorough and authoritative publication yet issued, and a standard work. The matter is issued in parts, of which there are three already published. *Price, per part, $5.00*

TREES, SHRUBS, AND VINES OF THE NORTHEASTERN UNITED STATES. By H. E. PARKHURST. In this book the author describes the trees, shrubs, and vines of the northeastern United States in a popular way, the book being designed especially for persons who have never studied botany. To these it will appeal as a valuable guide to a familiarity with the salient characteristics of trees, shrubs, and vines. *Price, $1.50*

TREES. A handbook of forest botany for the woodlands and the laboratory. By H. MARSHALL WARD. Vol. I, Buds and twigs. Vol. II, Leaves. Vol. III, Flowers and inflorescences. Three volumes to be added on Fruits and seeds, Seedlings. Habit and conformation of the tree as a whole. *Price, per volume, $1.50*

TREES AND SHRUBS OF MASSACHUSETTS. EMERSON. Two volumes. Plain cloth edition has 148 plates. The colored edition has 36 of these in colors.
Price, plain, $12.00 Price, colored, $18.00

THE LONGLEAF PINE IN VIRGIN FOREST. By G. FREDERICK SCHWARZ. This is a study of the life history of this important forest tree. Deals with the preference or dislike of the species for particular conditions of soil, climate, and environment. Should be of interest to all persons who are concerned in the welfare of our forests. Illustrations and six tables. *Price, $1.25*

THE SPROUT FORESTS OF THE HOUSATONIC VALLEY OF CONNECTICUT. By G. F. SCHWARZ. Illustrated study of forests repeatedly cut over. *Price, 35c*

MISCELLANEOUS.

OUR NATIONAL PARKS. By JOHN MUIR. If you want to learn about the glaciers, mountain peaks, canyons, and great waterfalls of the West; of the habits of animals from the squirrel to the moose; plant life from the big trees to the wild flowers—in fact be brought face to face with nature's works, this is the book.

THE EARTH AS MODIFIED BY HUMAN ACTION. By G. P. MARSH. A Revision of Man and Nature. Describes changes in the face of the earth caused by man, including desolation of various countries, once thickly inhabited, by removal of forests. Shows importance of maintaining natural balance of forces. *Price, $3.50*

UTILIZATION OF WOOD WASTE BY DISTILLATION. By WALTER B. HARPER. An important treatise on a subject regarding which the interest is great and the information scarce. Is intended to aid in the establishment and conduct of wood distilling enterprises on a business basis. *Price, $3.00*

HANDBOOK OF TIMBER PRESERVATION. By SAMUEL M. BROWN. Intended as a complete practical guide for the operator of a preservation plant, with hints on construction thereof.
Price, $4.00

Are you interested in timberlands?
Do you intend to sell any lands?
Do you intend to buy any lands?

If so, is it not to your interest to have accurate information as to your holdings?

OUR BUSINESS is the making of *EXAMINATIONS, REPORTS, MAPS,* etc.

STETSON & ALPAUGH
FORESTERS AND SURVEYORS
180 EXCHANGE ST. BANGOR, ME.
Send for pamphlet

Save the Birds and they will protect the trees
We build beautiful houses for the Purple Martin
Nesting-boxes for Wrens, Bluebirds and Swallows.
Send ten cents for 1911 Catalogue of Bird Houses and booklet containing fine half-tone cuts of bird houses in position.
Jacobs Birdhouse Co.
404 S. Washington St.
WAYNESBURG, PA.

ORCHIDS ORCHIDS

We are specialists in **Orchids,** we collect, import, grow, sell and export this class of plants exclusively.

Our illustrated and descriptive catalogue of Orchids may be had on application. Also special lists of freshly imported unestablished Orchids.

LAGER & HURRELL
SUMMIT, N. J.
Orchid Growers and Importers

Water for the Orchards
can be supplied in abundance without the expense of pumping by using

RIFE RAMS
Pump water automatically day or night

The first cost is low; there's no operating expense. Raises water 30 feet for every foot of fall. *Fully guaranteed.*

If there is a stream, spring or pond within a mile, write for FREE Plans, FREE Book and FREE Trial Offer.

RIFE ENGINE CO., 2172 Trinity Bldg., New York

NATURE EDUCATION AND RECREATION

FOR BOYS AND GIRLS: Per year
Nature and Science (of St. Nicholas Magazine)..$3.00

FOR MEN AND WOMEN:
The Guide to Nature (monthly illustrated)..... 1.00
$4.00
Both for one year—$3.00. Sample of either—10c.

FOR TEACHERS: Postpaid
How Nature Study Should be Taught (203 pages)..$1.00

FOR EVERYBODYS:
The Spirit of Nature Study (222 pages, illustrated).....$1.00
Walking: A Fine Art (164 pages, illustrated).... 1.50
Three Kingdoms—the Handbook of the AA..... .75

FOR PLANTS:
Sachs Nutrient Tablets—per box, postpaid—10c.

FOR YOU (to aid and be aided):
The Agassiz Association (Popular Nature Society.)

FOR CORRESPONDENTS (to write for further information):

EDWARD F. BIGELOW
Arcadia: Sound Beach Connecticut

A NEW ERA IN REFORESTATION

Up to date the needs of the forest planter for Native Grown, Low Priced stock suitable for forest planting have not been properly recognized.

Foresters ourselves, we understand that for economic forest planting the stock must be:

1st. Guaranteed native grown, and hence free from disease.

2nd. Strong, well-rooted, and thus capable of enduring the hardships, to which forest plantations are often exposed.

3rd. And most important, sufficiently low in price to justify the plantation as a financial investment.

Our prices are placed low enough to make your plantation profitable. Our stock is native grown, strong and of best quality.

We have a large stock of the principal conifers valuable for forest plantations.

Write for prices at once, as the very species you need may possibly be sold out early.

THE NORTH-EASTERN FORESTRY CO.
Box 1131 NEW HAVEN, CONN.

NOW READY

SHADE TREES IN TOWNS AND CITIES

Their Selection, Planting and Care as Applied to the Art of Street Decoration; Their Diseases and Remedies; Their Municipal Control and Supervision

Original Photographs by the Author. 46 Plates and 35 Text Figures, Comprising 229 Half-tone and 22 Line Illustrations. 8vo. XVIII.+284 Pages

By WILLIAM SOLOTAROFF, B. S.

Secretary and Superintendent of the Shade Tree Commission of East Orange, N. J.

$3.00 Net

THE PRINCIPLES OF HANDLING WOODLANDS

By HENRY SOLON GRAVES

Chief Forester, Forest Service, U. S. Department of Agriculture.

Large 12mo, 335 Pages, Profusely Illustrated with Line and Half-tone Cuts

Cloth, $1.50 net

JOHN WILEY & SONS

43 and 45 East 19th St., New York City

London, CHAPMAN & HALL, Ltd.
Montreal, Can., RENOUF PUB. CO.

Thorburn's Seeds

We carry a large assortment of seeds of EVERGREEN and DECIDUOUS TREES and SHRUBS, both native and imported. All of them are quoted in our catalogue, a copy of which will be mailed free on request.

J. M. THORBURN & CO.

33 BARCLAY STREET

Through to 38 Park Place

Established 1802 **NEW YORK**

ERIC FOREST SCHOOL

DUXBURY, MASS.

F. B. KNAPP, DIRECTOR

The Promised Land

may indeed be found in more than one portion of our beloved country; but in no section can it be more happily realized at the present time than in the heart of the Sacramento Valley—the district known as Sunshine Valley. Here exists those natural conditions requisite to happiness and prosperity—a soil of abounding fertility, water for irrigation in unlimited supply, and a climate healthful and favoring the growth of all products of farm and orchard—from alfalfa to oranges. We are offering choicest selections of irrigated lands in this district in tracts of ten acres and upwards. For particulars, address

J. W. HOBSON

Phelan Building, **San Francisco, California**

Davey Quality Tree Surgery Protects Trees & Tree Owners

There is nothing experimental about tree surgery as practiced by the Davey experts. Founded on the solid rock of John Davey's knowledge of tree life—equaled by that of no other man—it has been brought to a high degree of perfection through thoroughly tested methods, adequately trained men, and a live and healthy organization. All of these elements of strength combine to give a service of *quality* that affords *protection* alike to *trees* and *tree-owners*.

The Incomparable Trio of the Davey Service

FIRST—John Davey's life-long study of trees and their ills, during which he worked out the vital principles of the *science* of Tree Surgery. SECOND—The Davey Institute of Tree Surgery, maintained by the Davey Tree Expert Company at its own expense for the sole purpose of training its men in the science and practice of saving trees. There is no school like this—and tree surgery cannot be learned elsewhere. THIRD—A responsible organization of business men and business methods through which the service of the Davey Experts is given to the public, and its quality maintained to the high standards which make *tree surgery* so different from the work of tree-butchers and tree-fakirs.

You Love Your Trees—Then Help Them Live!

You who love your trees want them to be beautiful and physically perfect. Just as you would with other *living* things that are your friends, you should help your trees to overcome defects and prolong life. Dead limbs or decaying stubs should be removed and the wounds protected to prevent further decay. Open or hidden cavities should be cleaned, treated and filled. Whether just started or far advanced, splitting crotches should be secured against further damage. And so with all other ills of trees. But your trees will look right and *be* right after they are treated *only* when the work is done scientifically under the direction of trained men, working for a responsible organization.

If You Own Fine Trees—Let Us Help You Save Their Lives

Some trees are perfect—a few. Most trees need attention—some more and some less. Find out what yours need; get expert advice on their condition—it will save you money. The Davey *quality* service is now available east of the Missouri River at a *reasonable* cost. Send for full particulars.

SAFETY-ARMORITE CONDUIT CO.

Pittsburgh, Pa., January 19, 1911.

The Davey Tree Expert Co., Kent, O.

Gentlemen: I take pleasure in testifying as to the most excellent results obtained in the treatment of trees at my home, Century Oak Farm, near Monaca, Pa. Your Mr. Grimes and his assistants were most efficient in putting into excellent condition a number of trees which had become, through neglect, practically worthless. I am so pleased with the work you did for me that it will afford me great pleasure to answer in detail any inquiries from prospective clients that you may refer to me. Very truly yours,

(Signed) F. C. HODKINSON

Owners of fine homes, surrounded by numbers of beautiful trees, write at once for our booklets telling the Davey story—the story of tree salvation. Write promptly, for your benefit and our convenience, and state clearly how many trees you have, what kinds and where they are located.

THE DAVEY TREE EXPERT CO., Inc., 213 Plane St., Kent, Ohio (Operating the Davey Institute of Tree Surgery)

American Forestry

The Magazine of the American Forestry Association

EDWIN A. START, EDITOR

March — CONTENTS — 1911

COVER DESIGN—By Charles Cartwright.

WHITE PINE IN NEW HAMPSHIRE.....Three Pictures
From photographs loaned by the Society for the Protection of New Hampshire Forests.

THE PEOPLE'S POSSESSIONS IN THE APPALACHIAN FOREST—By Thomas Nelson Page..... 133

HARVESTING THE ANNUAL SEED CROP—By Sidney Moore..... 145

GROWING TREES FROM SEED—By C. R. Pettis..... 155

REFORESTATION IN MASSACHUSETTS—By F. W. Rane..... 160

THE PASSAGE OF THE APPALACHIAN BILL..... 164
TEXT OF THE BILL AS ENACTED..... 166

EDITORIAL—
The Appalachian Bill..... 168
Its Constitutional Aspect..... 169
Professor Glenn's Report..... 170
The Ownership of Timber Lands..... 171
American Conservation..... 171

CURRENT LITERATURE—
Reviews.—Glenn, Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin..... 172
Monthly List for February, 1911..... 173

NATIONAL FOREST WORK—
The Resignation of District Forester Chapman 177
Grazing Examiners..... 177
National Forest Fire Losses and Range Use.. 177
An Eucalyptus Experiment..... 177
The Experimental Wood Pulp Mill..... 178
Boundary Changes..... 178

STATE WORK—
The Year's Forest Legislation in Vermont.. 179
Nebraska..... 180
North Carolina Forestry Association..... 180
Northern Forest Protective Association..... 180
Ohio State Forestry Society..... 181
Forest Fire Losses in California..... 182
New York..... 182

THE LUMBER INDUSTRY—
Commissioner Smith's Report on Standing Timber..... 182
Hardwood Manufacturers' Association..... 185
Northern Hemlock and Hardwood Manufacturers..... 186
Pennsylvania Lumbermen's Association..... 187

AMERICAN FORESTRY is published monthly by the American Forestry Association. Subscription price, two dollars per year; single copies, twenty cents.

MANUSCRIPTS submitted for publication should be addressed to the Editor, at the office of publication, 1410 H Street N. W., Washington, D. C.

Indexes for Vol. XV (1909) are ready and may be had on application

Application pending for entry as second-class mail matter at the Post-office at Washington, D. C.

HEADQUARTERS FOR FORESTRY STOCK

DON'T WAIT until the **RUSH** of the Shipping and Planting Season, but go over your requirements **NOW.**

Our extensive foreign reservations have been personally inspected and are **A No. 1 Stock,** as may also be said of our domestic material.

IT WILL PAY YOU to get in touch with us if you are in the market for any of this class of stock, both from **Quality** and **Price** point of view. **LET US SHOW YOU.**

ALL THE LEADING VARIETIES

Larix Europea, 2 yr. Seedlings
Pinus Austriaca, 2 yr. Seedlings
Pinus Austriaca, 2 yr. Transplants
White Spruce, 2 yr. Seedlings
Scotch Pine, 2 yr. Seedlings
Scotch Pine, 2 yr. Transplants

NORWAY SPRUCE 2 and 3 yr. Seedlings and 3 yr. and 4 yr. Transplants, **BY THE MILLION** XXX Stock. Write for special prices per 10,000, 100,000, 500,000.

Seedlings and Transplants of White Pine, Balsam Fir, Hemlock, Maples, Catalpa, American Ash, Black Locust, Black Walnut, Red Oak, etc., etc., and **Cuttings** of the Poplars, Willows, etc. Ask for prices per 1,000, 10,000 or 100,000.

We also make a specialty of Shade Trees for Street and Park Planting and solicit your inquiries and orders for first-grade stock.

Are you on our Mailing List? If not, let us know and we will see that you get our present Catalog and future issues.

F. W. KELSEY NURSERY COMPANY

150 BROADWAY, NEW YORK

In the Heart of the National Forest Region

Colorado School of Forestry

Four years' undergraduate course in Theoretical and Applied Forestry leading to Degree of Forest Engineer.

Two years' graduate course leading to the Degree of Master of Forestry.

Winter Term at Colorado College, Colorado Springs, Summer Term at Manitou Park, the School Reserve, 10,000 acres of pine and spruce timberland on the borders of the Pike National Forest.

Tuition Sixty Dollars a Year

For further particulars apply to

Professor PHILIP T. COOLIDGE
Colorado Springs, Colo.

HARVARD UNIVERSITY

THE DIVISION OF FORESTRY

Offers a two-years' graduate course leading to the degree of Master of Forestry

The course includes upward of six months, field instruction and practical experience in the annual operations on the Harvard Forest, Petersham, Mass.

For further particulars address
RICHARD T. FISHER, *Chairman*
Cambridge, Mass.

As sunbeams stream through liberal space
And nothing jostle or displace,
So waved the pine tree through our thought
And fanned the breeze it never brought.

WHITE PINE IN NEW HAMPSHIRE

THESE WOODS GROWN FROM SEED HAVE BEEN UNDER EXCELLENT MANAGEMENT FOR THREE GENERATIONS

WHITE PINE IN NEW HAMPSHIRE

WHAT AN OCCASIONAL SEED TREE WILL
DO IN THIS REGION

WHITE PINE IN NEW HAMPSHIRE

FOREST IN KEENE FROM WHICH $48 PER ACRE HAS BEEN THINNED LEAVING $64 PER ACRE FOR ANOTHER CROP

American Forestry

VOL. XVII MARCH, 1911 No. 3

THE PEOPLE'S POSSESSIONS IN THE APPALACHIAN FORESTS

By THOMAS NELSON PAGE

(Address before the American Forestry Association at the annual dinner, Washington, January 13, 1911.)

WHEN John Evelyn, in view of the impending disaster of the complete destruction of forests in England, was commissioned by the Royal Society of Great Britain to address them on the subject of forestry, he delivered a book, and possibly, if one should measure up to the importance of the subject of the preservation of the forests of this country, especially of this older, eastern slope, he would endeavor to follow the example of that illustrious predecessor and undertake likewise to give a complete essay on the subject. If he could prepare such a work as John Evelyn's "Silva," then, indeed, it might be worth while to hazard even taxing the patience of the public, for it is one of the quaintest works in the English language, and if one but have the faculty of skipping with propriety, he will find it one of the most thoughtful, charming and instructive works that the notable literature of our fathers can boast of.

In view of the fact that our new interest in the preservation of our forests is due to the sudden forcing on our attention of the extraordinary disappearance of our forests with the disastrous consequences that are following it, it cannot but be interesting to reflect that this great contribution to our literature grew out of the sudden realization on the part of the leaders of the English people that their great forests, once the pride of their country, had been depleted far beyond the danger point, and that the public mind needed awakening to the peril that unless the waste were stopped England would soon find herself without the timber requisite to maintain the wooden walls on which her salvation depended.

Here, after two centuries and a half, we find ourselves in this land which was once wholly covered with forests confronted by the same impending disaster, a disaster from which in turn the peoples of Asia and of Europe have suffered injury beyond the power alike of calculation and of repair and, as in John Evelyn's day, every far sighted man is called on to take service in the cause of education in this vital matter. The most obvious argument which one might urge is of course that of material return; but there are other returns not less important than the one which may be measured by the lumber standard. The influence of the forest and the grove on the human mind, and thus on human progress, is one which may not be directly measured, for it is immeasurable.

A great physician (the late Dr. Hunter McGuire of Virginia), stated that he once performed an operation which restored sight to a child who had been born blind, and that soon afterward he asked the child what was the most beautiful thing in the world, and the instant answer was "a tree."

It must have been in the realization of this truth of nature that the Holy Record begins with the placing of a tree in the midst of the garden which God planted, and ends with the same conception of beauty—the tree of life whose leaves are for the healing of the nation.

The discussion of the merely material advantages to be reaped from carrying out the broad and high-minded plans of the Forestry Association for the conservation of the forests of the Appalachian range through means of great government parks will be left to those more familiar than the writer with the statistics of the subject; as will also the discussion of the technical, legal and constitutional questions which appear to be somewhat involved in the plan be left to those whose responsibility is to direct the destinies of this country by constitutional methods for the benefit of the people of the land. The writer proposes to present his plea for the preservation of the people's possessions in the Appalachian forests on grounds which appeal to him in the hope that if sufficient interest can be aroused among the people of this great country, this important subject may be dealt with in such a manner as to preserve this priceless possession of the people to them and their posterity forever, without in any way impairing the even more priceless possession of procedure according to unquestioned constitutional methods.

It is true that most people are touched through appeals to their material interests; but it is even more true that a great number may be touched through an appeal to their reason, and that yet higher motive power, their sentiment. The argument of loss through the waste of billions of feet of lumber may appeal only to the limited class of those who might profit by a more conservative and wise method of dealing with these resources. But the argument of saving from destruction at the hands of greed alike "the glory of the forest" and the fertility—indeed, the existence of the soil of not only the contiguous territory, but of the whole surrounding region, will appeal to all lovers of their country. The only thing needed is to educate them—to bring clearly to their intelligent apprehension the fact that the present system of forest destruction is one that, reversing the poet's dream of the statesman's work, "To scatter plenty o'er a smiling land," is as certain as any other law of nature, to scatter ruin and turn the fertile places into a desert. The history of all countries, written in the unmistakable records of perpetual erosion shows this, where tracts of endless desert stretch in regions once as fertile as a garden and where the silence of the wilderness has succeeded to the life of a teeming population.

The future of forest conservation in this country depends as does the future of constitutional government of the country on the education of the people. No branch of education has advanced with more rapid steps of late than has that which relates to forestry, and whatever may happen in the future the foundation of this branch of our national development was laid by one who was for several years a high executive officer of the American Forestry Association, who first brought the subject as one of national importance to the attention of the American people. No man in the world comprehends more fully and appreciates more highly the debt which this country now owes and which coming generations will continue to owe to the zeal and far-sightedness of the man who is the true father of conservation in this country. Forestry is his passion and the ennobling influence of this noble pursuit was never more plainly manifested than in the enlargement of his mind to take in

and comprehend the extended scope of the idea of conservation. "Nihil est homine libero dignius," says Cicero, whom Evelyn quotes with delight, adding this from the poet of the Georgics, "Silvae sunt consule dignae"—"No, not the majesty of a consul." If at one time or another—if in this matter or that matter, he has been over-zealous—even wrong-headed, if his opponents please—this in no respect affects the basic fact that, owing to his zeal and his passion and his patriotism, has come into being the sudden realization on the part of the American people that they have a great possession which was steadily passing away forever, and that they have awakened to the vital importance of so using it, as to preserve it for the future benefit of posterity.

It is well for the American people that the alarm bell has been rung and that this trumpet note has been sounded haply in time. For the exigency is not less great in America today than it was in England when Charles II, amid the dissipations of his court, was suddenly awakened to the fact that the forests of England were being destroyed beyond the hope of resurrection, and founded the Royal Society of Great Britain with a view to establishing a great scientific society which should scientifically promote the reforestation of England.

When the curtain which had through the ages veiled this western continent from the peoples of Europe was drawn aside and the vision of America first dawned on their astonished view, nothing impressed them so much as the unimagined wonders of the products of this virgin land. The reports of the first voyagers and of their successors not only for some years, but for some generations, were so wonderful that they were considered to excel the narratives of Mandeville, Marco Polo, and even to eclipse those of the redoubtable Baron Munchausen. Gold, of course, was believed to be here in such quantities that even the commonest vessels of the barbarous inhabitants were believed to be formed of this precious metal. The sea shore was believed to be pebbled with precious stones, the rivers were reported to be so filled with fish that men might walk over dry shod upon them. Even now the dream of Eldorado remains in men's minds and if the imagined city of the Incas has not been found, in desert regions long afterward discovered, gold has been found in quantities greater than even fancy imagined. As they penetrated further to the westward they found other products in equal magnitude. Wild fowl that filled the rivers, the forests and the prairies in quantities which surpassed the capacity of the mind to calculate. Wild game, not only such as kings and nobles were entitled to hunt in the old country; but of new species—the buffalo, the elk, and the antelope—filled the forests and covered the prairie. The quantity was beyond the previous reach of the imagination of man, and even today it staggers the credulity of a generation whose fathers saw them with their own eyes.

But of all the wonders of America, nothing amazed Europe more than the vastness of the forests which covered the continent. All records and reports are filled with the proof of this amazing growth of forests from sea to sea, and from the icy north to the tropical regions of Mexico. But a few generations ago, at most in the time of our grandfathers, this well-nigh fabulous condition as to game still remained. The buffalo, the elk, the antelope, though they had retired before the advance of the destroyer, man, still covered the prairies and filled the mountains of the west, in almost infinite numbers. The wild fowl in their flight, at times darkened the sun and quite blackened the waters and filled the forests. Today there are of the most noted species scarcely left enough to stock the zoological gardens, while other species both of animals and fowl are rapidly disappearing and in a few generations will probably be not less scarce than the buffalo and the antelope are today.

The same fate which has befallen the denizens of the forest at the hand of man, is now proceeding and with equal rapidity against the forest itself. With

the axe and the yet deadlier weapon, fire, the forests of the country are being destroyed in a prolonged fury of sheer wastefulness, the wastefulness which is one of the marks of that madness with which the gods visit alike men and nations whom they wish to destroy. Much of this destruction is due to sheer ignorance and heedlessness; but the end is the same and unless the people at large can be awakened to a full realization of the enormous folly of such destruction, the time must come within a few generations when the forests of this country will have disappeared as completely as the forests of Western Europe and of Eastern Asia.

The three great enemies of forests are storms and fire and man. There are others but these are the most destructive and of the three, man is easily the most deadly. Attention may be called to the fact that, though one of the greatest enemies in the world to forests is the storm which is always destructive and often with its besom of destruction sweeps down everything in its pathway, yet this subject of forest conservation appear to have survived in full vigor and health one of the most threatening and violent commotions which has happened in our day, and all may rejoice that, though the lightning has been continually playing around and the thunder has sometimes been almost deafening; though, indeed, from time to time the forked bolts are still flashing and the rolling thunder still reverberating, they are growing further and further away; the chief violence of the hurricane appears to have spent itself; the atmosphere appears to be clearing and the subject of forest conservation still survives apparently unimpaired. It is a good augury that possibly there are a good many who like myself steadfastly endeavored amid the greatest commotion to maintain an equable frame of mind and to pursue that middle course which in most things is safest, who have never felt it necessary to accept the extreme view on either side, but have been glad to recognize the admirable and indeed invaluable work which has been accomplished by those who have so earnestly sought to preserve for the people—the people of this age and their posterity alike—their priceless possession which without their zealous advocacy would have been lost forever.

One of the chief dangers of this extreme contention was the apparent transference of all the thought and energy of the country from the general subject of conservation to the particular and distant subject involved in the controversy, and the advocates of conservation may felicitate themselves that there is some interest still left in the conservation of resources this side of Alaska and even of the Rocky Mountains.

In my early life the mountains that I knew were those whose azure tops appeared on clear autumn evenings along the horizon's rim to the northwestward—the mountains which Spottswood with his knights of the Horse-Shoe had crossed to plant beyond them the flag and establish the civilization of the Anglo-Saxon—the mountains amid which George Washington had spent his useful and sobering youth as a young surveyor in communion with Nature and God, and which he had penetrated at that age which seems so great to boys—the age of bare majority—to carry the message of the Anglo-Saxon to the Frank in his commanding fort at the junction of the Allegheny and the Monongahela. An old map of North America used to hang on the walls of the sitting room in my old home in Virginia, nestled amid primeval oaks and hickories beneath which Tottapottamoy children must have played. It contained meagre details only as far west as a short distance beyond the Mississippi River. All the rest was blank, save that there were large lettered names of territories with vague boundaries in the wide expanse to the westward and beyond was a mountain range sawed across the west, marked "Rocky Mountains," with the fringe of the Pacific Coast beyond them. To the northwestward beyond a great blank, vague space, marked "British Colum-

bia," was an even more uncertainly defined space marked Alaska, forever fixed in infinite distance by "The wolf's long howl on bon Alaska's shore." Youth knew, therefore, something of geography even in our boyhood—knew, that is, where the Rocky Mountains were, though they were far beyond the region whence at Christmas time came the buffalo tongues and prairie chicken from cousins in far Missouri. The Rocky Mountains were, indeed, as far as the Mountains in the Moon are to us now, and the Allegheny Mountains were mountains of our youth and next to them were the White Mountains and the Green Mountains to the northward, where the name of Washington had been given as was fitting the highest peak that overlooked the Presidential mountain range of New England, and the waters of the Atlantic.

Possibly, it is for this reason that the writer still retains an especial interest in these eastern mountain regions. There are, indeed, other reasons for his interest, only one of which he feels need be mentioned now, that is, that from a more intimate personal knowledge of them since he grew to man's estate and long before this doctrine of conservation became such a national thought he has felt that they belonged in a peculiar way to the people of this country and that if properly cared for, preserved and utilized they would furnish a more invaluable asset to this country that even the average member of the Forestry Association dreams of.

In the discussion of this subject it is not necessary and the writer does not wish to express an opinion upon that phase of it which would lead him into the technical, legal, or political questions relating to its occupation and legal ownership. If he has apprehended aright the discussion which has taken place we are in some danger of abandoning the proper and more essential ground on which to base our claim for the preservation of the treasures in this region for a more narrow, technical, and debatable one—that of the extension of governmental powers based on the government's right to control of navigable streams. I feel that the work of this great forestry movement is larger and less factional and less political and more national than can be measured by any appeal to possibly questionable governmental powers. Its strength, its breadth, its present and future vigor and its perpetuation are all dependent on its being so conducted that it shall avoid all questions of doubtful expediency and commend itself by its wisdom and breadth to the great body of American people and thereby become associated with their pride and their patriotism and become the ward of their national care.

With regard to the forests of the White Mountains, the writer thinks that the able and shrewd representatives of New England may be counted on to lend their aid to what is so manifestly to the advantage of that section. But as one who, as a summer resident on that coast, participates in the benefits alike to body and soul of that charming summer air, he ventures to urge the preservation of the forests as even on the lowest ground of material return the plain part of wisdom. Those forests are worth more to New England every year than every foot of lumber in them would be worth sawed and dressed. They are a perennial source of income to the whole New England coast. Poets have hymned their beauty until they have entered into the heart and mind of the people and become enshrined in their literature, and however one may question the vaunted primacy of New England in other matters, he must acknowledge that in the autumnal glory of her mountain forests she stands unrivaled. If they shall be destroyed New England will suffer a loss which can never be made good. The White Mountains will in a few generations become the black mountains, and the most famous summer resorts of New England will in time be deserted by the teeming multitudes who now find recreation and health amid their forest clad ranges.

Leaving this branch of the subject to others the writer may take up the question relating to the Southern Appalachian range. When one speaks of

interest in tracts of forest, and in ore-bearing regions nowadays it behooves him to make his position clear. His interest in the Southern Appalachian range is a patriotic and not a pecuniary one and the same may be said of his interest in the White Mountains. It is solely that they may be preserved for the nation. And first it is his belief that they, like the White Mountains of New England, are in the future to be the great health resort and the great pleasure ground—in its higher sense—of all the people of the eastern part of this great country. The parts that have been opened have already become a great health resort. Nor is this the least remunerative way of using mountains. The Land of the Sky in North Carolina has paid the country more than if every stick of timber in it had been sawed and shipped as lumber. So it will be of other portions of the range. Modern science has discovered that a certain elevation neither too high nor too low is best adapted for the health of the human race. Near enough to the sea to feel the influence of that ocean which "creates a climate with its breath," and yet far enough away to have the rawness and the dampness strained through its fine-spun temse of forest, high above the influence of malaria; contributing with its beauty and its charm to the welfare alike of body, of mind, and of spirit, this region seems as if placed by God for the cure and abiding health of the race that inhabits this country.

In considering this all important matter of the conservation of our national resources of forest in this region, the richest opportunity offered to the advocates of conservation—richer than the preservation of all the forests that clothe the Appalachians from one end to the other is one that has been little considered. No delicate questions of constitutional construction arise touching it. At a glance it will be seen to be the plain duty of every one of whatever view as to national powers to aid in the movement. It is the educating and uplifting of the mountaineers, who inhabit this region. Like the Swiss mountaineers they are the greatest lovers of their homes in all the world. Without their co-operation the whole power of the United States can not save these forests. With their aid the thing will be done beyond a question. The writer declares his belief then that not only the best way, but the only way, to preserve the forests of the Appalachians is to avail ourselves of this richer opportunity and educate the strange and sterling people who dwell among the mountains and constitute their population. In this great region of the Appalachians dwells a race which needs only to have the mountain regions fully opened up to renew one of the most vital strains in our national life. Some three million souls inhabit the Appalachian range and its intervening valleys extending from the Pennsylvania border almost to the Gulf of Mexico. They are absolutely of Anglo-Saxon blood, whilst in other portions of the country, even in a portion like Massachusetts in the very heart of New England, which was once as absolutely Anglo-Saxon as is now this region of which I speak, foreign immigration has so changed the complexion of the population that 80 odd per cent are now foreign born or the offspring of foreign-born parents. In the Appalachian range the foreign-born population is so small as to be absolutely negligible, in some of the states it being less than one per cent.

It has been customary to apply to this mountain population such terms as "poor white," and "mountain cracker." Heaven knows they are in the main white enough and poor enough, but if the designation is intended to convey a term of reproach it is wholly misplaced. These people are the mountaineers of America—pure bred English, Scotch and Scotch-Irish stock. They have the names, they have the physiogonomy, they have the characteristics, they have the vices, to some extent only, and they have the virtues and more than the virtues of the rest of the body of the American people. *Montani semper liberi.*

They are the guardians of liberty in this western world as they have ever been in the Old World. They are the custodians of the old speech and the old racial traits. The whole military force of the country would hardly suffice to turn their mountain region into a preserve against their will; but with their aid it would not require a corporal's guard. It is of the utmost importance then, that in this movement their interest and their co-operation be enlisted. And the best way to do this is to enlighten them, to prove to them that the movement will be for their good—in other words to educate them.

One of the most promising signs of the times is that our people as they make money are beginning to return to the soil. If our life should be confined to urban life this country would scarcely survive two generations, or at most a half dozen. The civilizations of France, of England, and of Germany, like indeed that of Rome, were all preserved from going to absolute ruin by the fact that their upper class who owned the land, after dissipating in the cities, returned to their rural estates for recreation. The tendency of the time has been absolutely in the direction of commerce, and if we have reaped the fruits of it that are good, so we have also reaped those that are evil. There was never a country in the world in which so large a portion of its wealth and of its thought and activity were applied to commerce and trade as in America. And we should all turn traders and go to bargaining and chaffering with each other till we had lost the principles on which all moral and physical advance are founded, if it were not for the country life. It is the panacea that Nature has appointed for the ills of violating her laws in the unwholesome atmosphere of city life. It would, therefore, appear to be the part of wisdom for every man in the nation to do what he can to uplift country life.

Owing to the physical conditions of this mountain region they have been secluded and sequestered from the pathway of advance, shut within their mountain walls they have been cut off from all or nearly all the advantages of modern progress.

A century or more ago they rendered an inestimable service to this country in that they manned and held against the Indians and the French the outer bulwark of American rule on this continent. They furnished the pioneers who crossed over and seized the Mississippi Valley. Again a half century ago they rendered to this country what I believe most of you here will esteem an invaluable service. Without them this Union would have been divided as surely as I stand addressing you tonight. Non-slave holding, participating little in the advantages of citizenship in the several states and therefore caring less for the divisions of state lines than for nationality and racial solidity, knowing little of history save that which their grandsires had handed down to them, with the rifles with which they fought at King's Mountain and on the Kanawaha, they espoused by a great majority the cause of the Union. They furnished over 180,000 men to the Union armies, and they were not bounty jumpers or conscripts. But more than this they furnished to the Union cause a great friendly territory staunch for the Union through its breadth and length, extending for hundreds of miles down through the south and cutting the Confederate south in two. But for them Maryland and Kentucky would have gone out of the Union with a rush and Tennessee and Virginia would have been solid from east to west. You will perhaps get some estimate of what they merit at the hands of the Union if you but recall that in their territory Rosecrans, one of McClellan's lieutenants, was able to withstand him who was possibly the greatest captain of the English speaking race. When the seat of war was shifted from the mountains of West Virginia to the low lands of eastern Virginia, Lee was able to sweep McClellan from the gates of Richmond. But for them Missionary Ridge and Chattanooga would never have given Grant his laurels; but for them Sherman could never have marched

across Georgia to find the south empty of men; but for them the cause of cecession would have inevitably succeeded.

I do not wish any one to misunderstand my personal position on this subject. In every fiber of my being—body and soul—I was with Virginia and the Confederate South. But as my people were Union men before the war, so they became Union men when the war closed, and however I may hold in my inmost heart the sacred memories of the unhappy and glorious past, I know now what the south is to this Union and I know how to honor those who were gallant foes even then.

I therefore make no apology for advocating before you the claims of this great population. As they saved the Union in times past, so in face of the rising tide of foreign immigration I feel that they may be destined to save it again. And it is one of the chief causes of my interest in this discussion tonight that I am wondering what effect this movement in the direction of securing a national forest in the Appalachian mountains will have on this population. If it will benefit them, if it will carry to them the light of knowledge, if it will open that region for the diffusion of the better part of modern science and modern knowledge, then I shall be heart and soul for it, and I believe that it will tend to do so. What is needed is that the rest of the world shall know that this population is among her Appalachian mountains; that they shall know what a virile strain courses in their veins; that they shall know that all that is needed is that the light shall be carried to them. They are beginning to awaken themselves to the knowledge that they are in darkness; they are beginning to see the glimmer of the light afar off and are groping their way towards it, asking that it may be brought nearer to them.

It has often been a cause of wonder to me that with philanthropy pouring out its lavish millions for the education and betterment of other races and other sections, so little of it should have gone to this race and region which saved the Union. All that they need is light and they may become themselves the torch-bearers of the future civilization.

I have not had time to go fully into the history of these mountains and these mountaineers, but I will tell you a few men who have come from there and by them you may judge their possibilities. Andrew Jackson came from there; Stonewall Jackson came from there; Abraham Lincoln was the son of one who came from there.

Do you think that the strain which produced these men has died out in the past generation? If so, you are vastly mistaken. No more virile strain of men and women exists in any quarter of the world than today inhabits the Appalachian range, and no one which promises more for the future welfare of this country. One of the most distinguished citizens of New York—a man of national reputation as an orator and a lawyer—was a mountain boy from the eastern corner of Tennessee, and what is more he was one of fifteen sons. His father never learned to write until after he was married and his mother never learned to write, but, mark me, this illiteracy did not necessarily mean ignorance. It was only that they had not had the opportunity. That father was a lieutenant in the federal army during the war and afterwards he reared fifteen sons in the fastnesses of the Appalachian range.

Now, sirs, talk about conservation, here is something worth conserving. Conserve the American strain in the Appalachian range by bearing to them the light of knowledge and giving them the advantages of education and training and you will have the basis of the greatest government park that this or any country has ever known.

Few schools or colleges of any importance exist among them. The states give them their share of the taxes levied for common school education, but the southern states still have a great illiterate population and are still unable

to meet with any adequacy their needs. Here and there private philanthropy and devotion has established some admirable schools, such, for example, as Miss Berry's school in Georgia; Miss Pettitt's school in the mountains of Kentucky; and Archdeacon Neve's school in the ragged mountains of Virginia. And there is a college or two, the most noted of which is Berea College in the mountains of eastern Kentucky. All of these are doing great work, but what are they among so many. They are but lights on the mountain to show the wanderer that human sympathy still exists and to encourage the lost not to despair. The writer feels that he could not render the cause of forest conservation a greater benefit than to call to public attention the fact that in this great forest clad region which so clearly demands preservation at this time is a population kindred to the best element of our people, constituting a great reservoir of conservation of those traits of the Anglo-Saxon which made this country the home of liberty and to which we may hereafter have to turn for the salvation of the Union as the Union turned to it in the fighting sixties.

In those mountain regions, when the fire in the cabin has been extinguished, they often have to send to a neighbor across the mountain to borrow fire. All they ask of us now is "Lend us fire." Should we not do so? Let us apply ourselves and our powers along this line of conservation. If we do, we may be very sure that the time will come when they will return into our bosom a hundred fold for all the gifts that we now bestow upon them.

It is interesting to observe in the literature of the ages the part that trees represent in the history of the race. In that wonderful record in Genesis, God's first creation was the heaven and the earth. Light from the spirit of God was the primal act. In the first day and in the second He created the firmament and divided the waters from the waters, and in the third day he created the dry land and the sea and the grass and the tree before he created man, thus before He created the inhabitants of the sea and of the earth He created the tree. And when He had created man in His own image and had given him dominion "over every living thing that moveth upon the earth," he said to him, "Behold, I have given you every herb bearing seed upon the face of all the earth and every tree in the earth which is the fruit of a tree yielding seed, to you it shall be for meat." To the beast of the earth and the fowl of the air and the thing that creepeth upon the earth He gave the green herb for meat; but He gave to man the tree for meat.

In the other and briefer account of the creation it is said that the Lord God planted a garden and there He put man whom He had formed. And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food, the tree of Life also in the midst of the garden and the tree of knowledge of good and evil. Thus the beauty of the tree was placed even before its usefulness.

Now from this earliest record on down you will find that the tree is an object of peculiar reverence to the poet and the seer, and are they not the leaders of the race?

There are those who would maintain that our aboriginal ancestors made their homes not only among but in the trees—were, to use the scientific phrase, "arboreal" in their habits. It is not necessary to enter on this discussion; it may be passed with the simple recall of the old woman's speech to the young evolutionist, that "if he preferred to think his ancestors were the same with those in the 'Zoo,' well and good; but she preferred to think hers were in the garden of Eden."

So all the way down history sacred and profane we find the tree mentioned with respect and with reverence; for even then without doubt in those regions inhabited by the older races the disappearance of the forests had become a matter of public concern.

The Greeks with their high poetic sense peopled the forests and groves and even separate trees with a supernatural and half-supernatural population of nymphs and satyrs and gods, and born of their conception have come to us the most beautiful and entrancing poetry of myth and fable that have enriched human literature.

The Roman adapted but somewhat coarsened the poetical conceptions of the Greeks touching the relation of forest and grove to the spiritual side of man, and in accordance with their more practical genius turned it to practical effect. It was in a grove that Numa Pompilius, the first of her thoughtful kings, was said to have met his Egeria and the "Bosca Sacra" is still pointed out today to the credulous.

Among our own ancestors the forest was held in equal awe, and the grove in equal reverence. The poetical conceptions of the Greeks and the Romans, however, were changed to suit their heavier and duller intelligence. Thor and Woden, and the thunderous hierarchy of Scandinavia supplanted in their imaginations the more graceful and ethereal conceptions of the south; but the priests of their religion celebrated their awful rites under the shade of the oaks which clad the hills of the north.

If it should appear that this discussion of the forest is too fanciful to be of practical service in a movement in which the more practical and material use is the chief motive, it may be answered that after all the poetical is but a further and higher development of the practical and that it is a more inspiring power in that while the practical relates only to the lower motives of the individual, that which touches the sentiment has a more far reaching and unselfish result. If sentiment is to be discarded in the name of the practical, let every man get all he can at no matter what sacrifice of others, but even patriotism is founded on a sentiment which is high above the groveling personal demands of physical life. It must be through a sentiment higher than that of the self-seeker who destroys without remorse for his personal service the most beautiful things in creation that the blessings of liberty and the contentment of peace shall be attained. It must be through sentiment, the sentiment of generosity, of philanthropy and of patriotism, that those who have secured the advantages of education will extend them to others less favored. It must be through sentiment that man's mind shall be extended to take in the great conception of his duty to promote the welfare of his fellow man and uplifted to take in the yet higher conception of his duty to the Supreme Being who has clothed the mountains with the majesty and the hills with the glory of the forest.

As already stated, when Charles II founded the Royal Society of Great Britain, one of his motives was to establish a great scientific society which should scientifically promote the reforestation of England, for the disappearance of its oak forests had already become a public menace and it was at the instance of this society that John Evelyn wrote his great essay on forestry. In this work he alludes to the respect with which this subject is discussed by the great classical writers, and he deplores the indifference with which the English race regarded it. "Men seldom plant trees," he says in his preface, "till they begin to be wise; that is, till they grow old and find by experience the prudence and the necessity of it." And he recalls how "When Ulysses, after a ten year's absence, was returned from Troy, and coming home found his aged father in the field planting trees, he asked him why, being now so far advanced in years, he would put himself to the fatigue and labor of planting that which he was never likely to enjoy the fruits of, the good old man (taking him for a stranger) gently replied, 'I plant, against my son Ulysses coming home.'"

I think it may be said of nations as John Evelyn said it of men, that they rarely plant until they begin to be wise.

The great land of China with its teeming population is so denuded of forests that it is said that in many regions every stray weed and spray of grass is carefully collected and husbanded for purposes of fuel, and that men trundle hand barrows of coal for hundreds of miles to secure the fuel necessary to preserve life. Unless we shall awaken duly to the need of preserving our forests the time may come when this land shall be as China is today. There was a day when China had her forests, and though it may appear to us of a new country very long ago, a thousand years in China amounts to less than a century in the west. It is said that this danger of the disappearance of her forests became apparent to the rulers of China over 1,200 years ago, and that they set themselves to do what as has already been stated the king of England did after his restoration, to awaken the interest of the people in this vital national subject. A work on forestry was prepared by their direction which was so extensive that it is said to have contained over 50,000,000 of words, that is twice as much, possibly, as the most voluminous encyclopedia. It is said that three copies of this work were made and that the only one which survived was destroyed by the soldiers of the relief column of the allied forces which occupied the Chinese capital at the time of the Boxer rebellion.

One cannot go over Europe without being made aware of the devastating effect of indifference to the preservation of forests. For example: one could hardly ever forget the impression made in traveling over the desolate and treeless waste in Spain that lies south of the Pyrenees. Through the improvidence and folly of former governments this region that was once reckoned the most fertile within the sweep of the Roman dominion has become, if not a desert, something that looks very near akin thereto. The very song birds have flown from a region where not a tree or shrub is left to protect them and furnish the choir for their heavenly music. All through southern Europe the proof meets the eye that man has been forced with infinite pains, with a repentance as bitter as that of Esau, to make atonement for the carelessness with which he sold his birthright, for throughout this country in regions which must once have been covered with forests and which, owing to their denuding had the soil washed away, we see how infinite must have been the labor that was required to reterrace and reforest. We may all rejoice that the attention of the American people has been formally directed to this great source of national loss before it is too late.

It must often have struck every observant man not only how negligent the average American man is in the matter of preserving trees but how absolutely inimical he is thereto as in other departments of life. I think this state of mind is the result of natural causes and owing to that which at its best we term conservatism continues after the causes have passed away. England was once fully forested and then as its population increased the forests fell before them and tillage took its place; then came the Norman conquest, and in England, as in other countries, the conquerors and rulers, with a fine disregard for everything except their own wills, established forests not for the benefit of their people but for their own amusement, turning the cultivated lands that had been conquered from the wilderness back into wilderness and forest for their hunting ground. It was made a crime for the ordinary inhabitant to hunt any wild animal. To some extent this law, curiously enough in this age of democracy, still stands on the statute books. The forests thereby became identified with the power and tyranny of the court, and the common people had no interest therein. Indeed such interest as they had was only of hostility. Then when our forefathers crossed the main and came to this new country with its apparently inexhaustible forests, they found for a time that the forest was the covert of their two deadly enemies, the Indian savage, and his yet deadlier ally, malaria. So it was natural, possibly even

necessary, that the forests should be cut down. To conquer the wilderness and turn the forest into arable land which would support life was their first duty, and the toil which it entailed has remained to the present day in the memory of men to render them not only indifferent but hostile thereto. I think it is not too much to say that this is the state of mind of a large portion of our population, nor is it too much to say that the government could not proceed with its educational work in any direction with better results than by teaching the people of this country the principles of forestry.

I fell in, not long ago, with a young man, a neighbor of mine and a man of industry, a sensible man and a thrifty man, who had taken a piece of wild woodland and had cleaned it up with his own hand. He had married and built a snug little house on a hill commanding a fair prospect, and then he had laboriously cut down every one of the fine trees which surrounded his house. Finding him one day in his new ground preparing for his tobacco crop I expressed my wonder that he should have destroyed the fine oaks whose stumps about his house showed their former grandeur. "No," he said, "I do not like trees, I want nothing about my house bigger than a bush except fruit trees." I believe that he expressed the view of a considerable part of our population, and this view is not confined by any means to the laboring class. If you will take a ride around Washington tomorrow you will see such a cutting down of trees and destruction of the natural beauty about this capital of our country as possibly is not to be witnessed today within the same distance of any other capital in the world. I am happy to say that following the design of those broad-minded men who laid out this capital city on broad lines, its streets and avenues are beautified with trees in a way to do honor not only to their wisdom but to the wisdom of those who have the capital still in charge. But, though much is done, much remains to do, and there is even now within the heart of Washington a region where beautiful trees still remain, which unless it receive the vast care and protection of the government which the government may well give here in its own capital, must soon pass away.

I rejoice at this new movement in the direction of preserving our forests. No thoughtful man who recalls the destructions in half a generation of the buffalo and elk and canvas back duck and other forms of game, and who has seen the disastrous destruction of forests, especially no man who has traveled in other countries, can fail to be apprehensive of the effect of the universal indifference to the preservation of forests which essentially obtains in this country. My opinion is that the abiding work of the forestry department will be the awakening in the public mind of the necessity of preserving forests, and the convincing of the public mind, for we are a thrifty race, at least, if not an avaricious race, that it is to the individual's interest to harvest his timber in a scientific rather than in an ignorant way. Show the American people that it is to their interest to do anything and eventually they will do it. Partly stupid and partly over-confiding, they are often misled as to their own interests, but prove to them that it is to their interest and a thing will inevitably be accomplished in the end, and, above that, prove to them that a thing is right and it will be even more inevitably accomplished.

HARVESTING THE ANNUAL SEED CROP

By SYDNEY MOORE,

Assistant District Forester, United States Forest Service.

EVERY fall sees the harvesting of one crop throughout the mountainous, forested region of the West, which is not mentioned in any official "crop reporter;" a crop which few people outside of those directly concerned in its harvesting know much about, but a crop that is yearly increasing in quantity and value. It is the annual crop of forest tree seed, and the size of each year's crop is of real concern to the country at large, since the seed harvested is chiefly used in the reforestation of the vast burned and denuded areas of the Rocky and Pacific Coast mountains.

The collection of forest tree seed by commercial collectors has been carried on to a limited extent for many years in a few localities in the West. There is one professional collector in the Black Hills of South Dakota who for years has been gathering western yellow pine seed for sale to seed dealers, and has also exported quantities to Europe, especially Germany, where the business in tree seed is very extensive. There is a small village in the mountains near Pueblo, Colorado, where about a dozen individuals have built up a considerable industry of the collection and sale of tree seed. In 1909, the value of the seed crop from this one locality was about $8,000. These collectors sell their crops to seed dealers in this country and also to dealers in Germany. For a number of years there has been a very active demand from German dealers for seed from the United States, especially of Douglas fir. In fact, until the last two or three years, the export trade in forest tree seed has probably fully equaled the domestic trade, and the whole business has been very restricted. Recently this condition has changed, due to the fact that the Forest Service of the United States Department of Agriculture has undertaken an extensive campaign of reforestation by seed sowing upon the national forests, which demands immense quantities of forest tree seed of desirable species. And while the government collects by far the greater part of its tree seed through its own forest officers, still a considerable amount is purchased from commercial collectors.

The conditions and work of harvesting the seed crop described in this article are particularly typical of the Rocky Mountain region, and the work as carried on by the Forest Service upon the national forests of that region. The forests of the Rocky Mountains, as is well known, consist almost exclusively of coniferous species, in contradistinction to the prevailing broadleaf forests of the East. Consequently, the important seed crop consists of the seed of conifers, or evergreen trees. Although the forests contain a variety of species of trees, including western yellow pine, Douglas fir, lodgepole pine, Engelmann spruce, blue spruce, limber pine, bristle-cone pine, balsam, white fir, and junipers, only the first four named are of special commercial importance. Consequently it is the seed of these four species that is chiefly sought after for reforestation purposes. Even though the future forest is to serve primarily the purpose of protecting some watershed from floods and erosion, it is advisable to plant the seed of some species that will at maturity yield valuable commercial timber.

LOCATING THE CROP.

Coniferous trees do not produce a full crop of seed every year, but only periodically, as every two, three, or four years. In a year when the production of seed by a certain species is very large, commonly called a "good seed year," the heavy production will extend over a very extensive area, as for example, an entire state. In other years the same species may produce a full crop, or nearly so, over a much more limited area. For instance, the yellow pine has been found to produce a heavy crop of seed on a certain small watershed, when little or no seed at all could be found on other yellow pine trees outside of the particularly favored locality. During the past season, seed of Douglas fir in Colorado could be found in large quantities upon only one or two of the eighteen national forests in that state, although in 1909 its seed production was fairly widespread through the state. The fact that the production of seed is very apt to be localized makes it necessary every year to search the forests for the much desired crop. On the national forests the Rangers, each for his respective district, scour the forests to ascertain upon what watersheds, large or small, the trees of the desired kind are bearing seed.

The seed of the important conifers is borne in a cone (whence the name), and with the pines it requires two years for these cones to grow to maturity, while with the other species (spruces and firs) only one year is required. The new cones begin to form in the spring of the year, shortly after the year's growth begins. Thus the forest rangers can begin to locate and take stock of the year's seed crop during June, July, and August, although the crop will not be mature until September or early in October. Each ranger makes a report upon the kind and size of the seed crop upon his district early in the summer, and plans are laid well in advance for gathering in the crop.

TIME AND METHODS OF COLLECTING CONES

The seed crop matures naturally about the time of the first frosts in the fall, and in the mountains this time varies, of course, with the altitude. In the case of the desirable species, the cones open naturally while still upon the tree and release their seed. Accordingly, collectors must gather the cones before they open naturally, otherwise the seed would be lost. Since the seed are ripe in the cones for some little time before they are released naturally, it is possible to gather the cones with the seed in them. Collecting has been started as early as September 1, and continued as late as October 20, though this period varies somewhat with the season.

The cones which contain the seed, then, are what is collected, and not the seed itself. There are several methods of collecting the cones, which shall be described briefly, as follows: (1) climbing trees and picking; (2) picking from the ground, from low scrubby trees; (3) picking from felled trees; (4) collecting from squirrel hoards.

1. Climbing trees and picking: When the cones are gathered by this method, the collector is usually equipped with a pair of "climbers" like those ordinarily used in climbing telephone poles. The cones may be picked by hand from the branches, but more commonly the collector uses a sharp steel hook fastened securely to the end of a light pole about six feet long. With this hook he can cut the cones from the more remote branches or draw the smaller branches toward him so as to reach the cones by hand. As the cones are picked or cut off, they are dropped to the ground, to be gathered up later into sacks, or an assistant on the ground gathers them as fast as they fall. The quantity of cones which can be collected per day in this manner varies a great deal, depending primarily upon the abundance of the cones. Collectors have actually gathered from two to five bushels of yellow pine

cones per day, by steady work. However, as may be imagined, this method is slow and costly, and frequently the size and height of trees in the virgin forest prevents collecting in this way.

2. Picking from the ground, from low scrubby trees: While this method is much easier and less expensive than the former, it cannot be widely used, because the species most desired do not grow in open, park-like forests of short trees over any very extensive areas. Cones of yellow pine and lodgepole pine have been collected in small quantities by this method, but it can never serve for obtaining any very large part of the seed crop.

3. Picking from felled trees: This method is, of course, restricted to picking cones from the tops of trees cut down where lumbering operations are in progress. As might be suspected, there are many limitations on this method. Even if there is a heavy seed crop where cutting is going on, only a comparatively few trees are cut in ordinary logging operations within the brief period during which cones must be collected. Occasionally, with all conditions favorable, a large quantity of cones can be collected very cheaply in this manner, where timber sales are in progress on the national forests. But at the best, the method can only be infrequently employed.

4. Collecting from squirrel's hoards: Almost everyone has at some time observed the squirrels working very busily in the fall of the year, cutting off cones from the trees in forests of pine or spruce. These indefatigable little workers, chattering in the tree tops, scurry along the slightest branches and with sharp teeth cut the cones from the tips of the branches and drop them to the ground. The topmost, swaying twigs of the tallest pine in the forest hold no fear for the surefooted little creatures. In places where the squirrels are numerous and working their hardest, there is a continuous rain of cones from the tree tops, causing a noise and disturbance that must attract the attention of the most indifferent observer. After the cones are cut off, the squirrels collect them from under the trees and accumulate them in one place, the pile of cones constituting the hoard or "cache."

The squirrels show many peculiarities and much wisdom in locating and arranging these hoards of cones. In general the hoards are located at the base of a standing tree, against or under an old fallen tree, in a hollow log or stump, and often along the bank of a small stream under water. Sometimes the hoards are located in the open, away from any trees or logs. Usually, the spot selected for hoarding cones has been used for the same purpose several successive years and is readily recognized by the deep accumulation of old cone scales, since the squirrels break up the cones to extract the nutritious seed. The cones, when freshly cut from the trees, are in a green condition and full of moisture. If these cones are piled in an indiscriminate mass they soon begin to mould, and in the course of time will decay and the enclosed seed will be spoiled. The instinct of the squirrels teaches them to guard against the possibility of such an unfortunate occurrence. Instead of piling cones in a solid mass, the squirrels' hoards are carefully formed of many little bunches of cones, each bunch containing a dozen or more cones, buried in the forest litter and separated from the other bunches by surrounding litter. This arrangement insures the thorough aeration of the whole mass and prevents any destructive growth of mould. The hoarding of cones under water, which has been mentioned, is another clever scheme by which the squirrels preserve their winter's supply from possible decay, a sort of "cold storage" system devised by these little animals.

It is by taking advantage of the thrifty habits of the squirrels that seed collectors can gather cones most economically and in large quantities. The cone gatherers search through the woods for the hoards which have been described, and fill their sacks with the cones so conveniently cut from the

trees and collected together by the squirrels. The quantity of cones which may be gathered from a single squirrel hoard ranges from a few bushels to a dozen or more bushels. Among the large hoards recorded is one that yielded about sixteen bushels of yellow pine cones, another that yielded about fifteen bushels of Douglas fir cones.

At different times a more or less hysterical protest has been raised by some people against this so-called robbing of the squirrels. Persons interested in the preservation of our wild animals have alleged that this method of collecting cones would result in the starvation of the squirrels. If such were the case, it would indeed be a calamity. As a matter of fact, such gathering of cones from the squirrels' hoards as is done, while it may inconvenience the squirrels, has no disastrous results. The squirrels continue their labor after a hoard has been cleaned out, and in a very short time have a supply on hand equal to that which has been lost. In collecting cones, the gatherers work over an area only once, and then seek new fields, leaving the squirrels ample time to recuperate their losses before winter sets in. It would require a very strenuous and vindictive campaign on the part of man to steal from the squirrels of any locality so persistently as to reduce the winter's food supply of these animals to a dangerous point. Assuredly the wanton destruction of squirrels' hoards is a thing to be condemned, but so long as man takes for himself only a portion of their supplies, and that for a most useful and beneficial purpose, the practice should need no further justification.

EXTRACTING THE SEED.

After the cones have been gathered, by any of the methods which have been described, and placed in sacks, they must be transported to some central point where the seed may be extracted. The sacks of cones gathered in the woods are carried out to the nearest trail or wagon road. Frequently the cones have to be collected in such inaccessible localities that it is necessary to pack them for miles on horses or burros, which is, of course, a tedious and expensive method of transportation. As soon as a road is reached the cones are loaded into wagons. In one region, the Black Hills of South Dakota, where about twenty-five thousand bushels of yellow pine cones were collected during the past fall, pine cones were shipped by railroad, in carload quantities, to a central point, the railroad company making a new rate for this unusual class of freight.

After the cones have been gathered in large quantities at a central point, the most expensive part of the work of collecting seed is accomplished. But the work of extracting the seed from the cones, and cleaning the seed, remains to be done, and this part of the operation requires much care and attention.

Mention has already been made of the natural opening of cones allowed to remain upon the trees. The ripening of cones is brought about by the sun's heat, as with all other fruits, and when the cones are fully ripened they become completely dried out and the cone scales have curled back, releasing the seed, which is distributed widespread through the agency of the winds. Each little seed has attached to it a small membranaceous wing, that serves to carry it through the air to a greater or less distance from the parent tree, depending upon the velocity of the wind and the weight of the seed.

To obtain the much desired seed, it is, then, necessary to open up the cones that have been collected. There are two methods ordinarily employed to accomplish this, one method following Nature's way, takes advantage of the sun's light and heat, and the other method employs artificial heat.

In the first method the cones are spread out thinly upon canvass sheets laid upon the ground, preferably on a gentle slope toward the southwest and the sun. Since the cones must be spread thinly, a large number of

SCREENING PINE CONES TO FREE THEM FROM PITCH, NEEDLES, AND OTHER REFUSE BEFORE SPREADING ON SHEETS TO DRY

HARVESTING THE ANNUAL SEED CROP

DOUGLAS FIR CONES SPREAD ON CANVAS SHEETS TO DRY IN THE SUN

SEED COLLECTORS' CAMP WITH CONES SPREAD OUT TO DRY UPON CANVAS SHEETS

HARVESTING THE ANNUAL SEED CROP

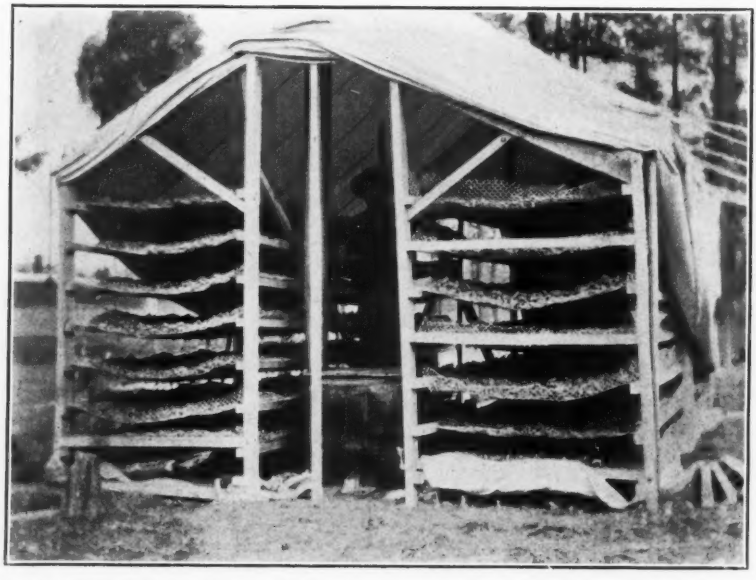
RAKING YELLOW PINE CONES OFF CANVAS SHEET AFTER THEY HAVE BEEN RUN OVER SCREEN AND SEED EXTRACTED. A SMALL AMOUNT OF SEED IS SAVED BY THIS OPERATION

SEED COLLECTION CAMP IN A ROCKY MOUNTAIN NATIONAL FOREST. SACKS ARE FULL OF CONES GATHERED IN SURROUNDING FOREST

HARVESTING THE ANNUAL SEED CROP

FOREST RANGER WINNOWING YELLOW PINE SEED AFTER TRAMPING IN A SACK TO SEPARATE THE WINGS

FOREST OFFICERS OPERATING A FANNING MILL, THROUGH WHICH SEED IS RUN FOR ITS FINAL CLEANING. ALL DUST, BROKEN WINGS, AND LIGHT SEED ARE BLOWN OUT FROM GOOD SEED



HARVESTING THE ANNUAL SEED CROP

PORTABLE CONE DRYING PLANT ON A NATIONAL FOREST. TENT EQUIPPED WITH WIRE SCREEN, TRAYS, AND A HEATING STOVE

canvas sheets are required to handle a comparatively small amount of cones. The cones must be covered over on rainy days and during cloudy, damp weather. To open up yellow pine cones satisfactorily they must be exposed to the sun in the manner described for about a week. Douglas fir and Engelmann spruce cones, having thinner cone scales, ordinarily dry out and open in less time than those species with thicker cone scales. However, the time required to open up cones in the sun varies greatly, depending upon the weather conditions and the relative dryness of the cones at the time they are spread upon the sheets for final drying.

The sun-drying method has the great advantage of being inexpensive, since the only equipment required consists of canvas sheets, the cheapest obtainable being used for the purpose. Furthermore, the drying sheets are easily transported (on pack-horses if need be) to remote places where the cones have been concentrated, and the extracting process carried out there, a very important consideration in our mountain forests, difficult of access. The great limitation upon this method is, of course, its absolute dependence upon a continuous period of fair weather, with sunny, dry days.

By the second method of extracting seed, which uses artificial heat, the cones are subjected to a temperature ranging from 100 to 120 degrees Fahrenheit for a period sufficient to open them. The cones are spread out thinly on shelves or trays of wire mesh in a closed room, but with sufficient ventilation to insure the escape of the moisture given off from the drying cones. As with sun-drying, the time required to dry out the cones is variable. Yellow pine cones under ordinary conditions will open up satisfactorily with a temperature of 100 degrees maintained for thirty-six to forty-eight hours.

Two types of cone-drying plants may be distinguished, namely, portable and stationary. A convenient form of portable plant consists of an ordinary canvas tent, in which drying trays can be built and a stove set up. A permanent drying plant may be constructed in any tight building where trays can be built and a stove or furnace installed. Because of the cost, a stationary plant is only advisable where large quantities of cones are available for drying, or can be easily transported to the plant. The advantages of drying cones by artificial heat are apparent, the process being carried on independent of weather conditions.

Whether dried by the sun's heat or artificial heat, the cones, as they gradually open, release the seed and a large portion of the seeds from each cone fall out upon the canvas sheets or drying trays whenever the mass of cones is stirred or handled. However, a certain portion of the seeds stick in the cones even after they have opened and most of the seeds have fallen out. In order to extract these refractory seeds the opened cones must be given a special treatment. The cones are gathered up from the sheets or trays upon which they have dried, and put into a contrivance called a "churn." This churn is merely a large box, about three feet square, mounted upon a frame so that it can be revolved by means of a crank. One side of the churn is covered with wire screen or slats, which permit the passage of seed but retain the cones in the churn. As a man revolves this churn, the cones are rattled about vigorously and the remaining seed shaken out of them. This churning process is commonly spoken of as "threshing" the cones.

CLEANING THE SEED

From the drying-sheets or trays the seed collector gathers up the seed extracted and adds to the mass the seed he has shaken out from the churn. The material which he has thus obtained is not exclusively clean tree seed by any means. The individual seeds still have attached to them the little membranaceous wings, and intermingled through the mass are broken seed wings,

cones scales, bits of dirt and refuse matter of all descriptions. In addition, a great many of the seeds themselves, while perfectly good in external appearance, are in reality abortive or "light" seeds, that is the kernel has never fully developed, so that the seeds would never germinate. What the seed collector desires, and what he must have if he hopes to market his crop, is perfectly clean, sound seed free from all wings, dirt or other refuse.

The next step, therefore, is to remove the wings from the seeds. This may be done by simply rubbing the seeds together with the hands, thus breaking off the thin, brittle wings. Often the seed is rubbed over a fine mesh screen, by hand, or a small quantity of the seed may be placed in a sack and then rolled and rubbed with the feet. Sometimes the seed are dampened slightly with water and then rubbed, the effect of the water being to loosen the wings from the seed. After the seed has been handled by some one of these methods it is given the final treatment, which consists in separating the good seed from the "chaff," the latter including wings, broken cone scales, and the other refuse. For this final cleaning the seed may either be winnowed in the open with a light breeze, or it may be put through a fanning mill, such as is commonly used in cleaning grain. The former method is a crude one, and a fanning mill is almost a necessity to clean seed satisfactorily and economically on a large scale. Frequently the seed may be winnowed to remove a portion of the chaff, and later given a final run through a fanning mill.

It has already been mentioned that in the Rocky Mountain forests it is often necessary to collect the cones in remote localities, more or less inaccessible to cheap transportation. In such cases the seed is seldom put through the various processes in one place. More frequently the cones are opened by the sun's heat in the locality where collecting is done, and the seed and chaff are then transported to some central place where the seed is given its final cleaning. By this scheme the transportation of the heavy, bulky cones is avoided, and the cost saved on the final product. When the seed has been satisfactorily cleaned, it is placed in seamless sacks and carefully stored, ready for distribution to the points where it will be used to grow new forests.

The amount of clean seed which is ultimately obtained from a bushel of cones varies with the species of seed, with the favorableness of the season, and with the care used in the work of extraction and cleaning. Rocky Mountain yellow pine will yield on an average one pound of clean seed from a bushel of cones, though frequently it exceeds this somewhat. Douglas fir yields about one pound of clean seed per bushel of cones.

The business of collecting forest tree seed is of large importance to private individuals in many localities, but the total amount of such seed collected privately is insignificant in comparison to the quantities being collected annually by the federal forest service throughout the west. As time passes, the annual tree seed crop will increase in amount yearly. With the perfection of methods for harvesting the crop, the cost per pound of the several important species will decrease, a matter of much moment, since an abundant supply of cheap seed is the first essential to the vast undertaking of reforesting the millions of acres of burned and cut-over lands throughout the forest regions of the western United States.

GROWING TREES FROM SEED

By C. R. PETTIS,

Superintendent of State Forests of New York.

THE idea of reforesting land is, at present, most popular and there is a rapidly increasing demand for information how to best undertake the work. In the eastern states where conifers with shallow root systems will be most generally planted, the best method is to plant small trees grown in a nursery. On account of the importance of the conifers, hardwoods will not be discussed in this article. The size and kind of tree to be used will depend upon soil, demands of the owners and other circumstances, but the method will be the same.

The first step in any reforesting operations will be securing the stock, and as the money is invested for a long period the cost of such plants should be carefully considered. There are certain kinds of trees that can be purchased abroad and imported apparently much cheaper than they can be secured in this country, but this is in the long run rarely, if ever true, of forest planting stock. The state of New York has imported a large quantity of various species and planted them. These plantations at first appeared satisfactory, but later examination showed that they are, in some cases, affected with serious diseases, and in others the per cent of loss is very high on account of the long transit and other factors. The quality of the stock is also a factor in considering price and final success. The stronger and thriftier the tree the more successful the plantation.

If any owner desires to plant but a few acres each year it will be more advantageous for him to secure stock from his state forest commission, if it is in a position to supply him, or from a reliable nurseryman. Any successful nursery operated at reasonable cost requires a large annual output and experienced supervision. The most economical method for any small planter who desires to use transplants will be to purchase seedlings and then transplant them at home, thus reducing packing and transportation charges in the first instance, and having any advantage of local labor for their care. He will also be assured of the quantity desired when wanted.

Four things are essential for a successful nursery: (1) good soil; (2) good seeds; (3) a water supply; and (4) proper methods.

The soil should be a rich loam, free from stone, thoroughly cultivated, preferably with garden crops before using, well fertilized, well drained, and with sufficient slope to effect surface drainage. The better the soil the more vigorous and larger the plants. The absence of stones facilitates transplanting and tends to reduce expenses. Previous cultivation, if the weeds have not been allowed to mature seeds, decreases the weeding. The production per acre is so large that any soil can be profitably used.

Good seeds are absolutely necessary because no matter how carefully all the other work may be done, satisfactory seed beds cannot be secured without seeds of high germination per cent and full of energy. Seeds should be purchased only after examining samples. Good seeds are heavy, rich

in oil and full of meat. Seeds should be purchased late in the fall and stored in tight tin cans in a cold building.

A continuous water supply is essential. The control of moisture conditions in the soil is of greatest importance in securing success. The soil should be well drained and not heavy, in order to reduce the surface moisture, while water should be provided when necessary. In our practice we have found that the growth of seedlings can be increased at least two inches a year by the proper application of water. Water is also necessary to retain proper moisture conditions in the seed beds and effect germination. During periods of drought large quantities should be applied to the young transplants.

The methods to be employed will depend upon the local conditions in minor points, but in general the following will apply to our northeastern states. The various portions of the work will be considered in the following order: (1) making the seed bed; (2) care of seedlings; (3) the transplanting; (4) care of transplants; (5) packing stock.

The seed beds four feet wide and twelve feet long are the most convenient, and such a bed will produce from 5,000 to 12,000 seedlings, each depending upon the success of the work. Each bed should be enclosed in a frame* covered with wire netting to exclude the birds who destroy the young trees by eating the seeds which are on the tip top of the young plants. This box is placed in position, the soil carefully prepared, the bed is made with a gentle slope about one and one-half inches higher in the center than at the outside and the surface of the bed about four inches higher than the path. The soil should then be saturated with water and the seeds sown carefully broadcast over the bed. The quantity of seed to be sown will depend upon the size of the seed which varies with species and is as follows: White pine, 12 ounces; Scotch pine, 8 ounces; Red pine, 6 ounces; Norway spruce, 8 ounces; European larch, 12 ounces. These seeds should then be pressed into the soil and covered lightly to a depth of about one-eighth of an inch with sterile soil carefully sifted. The box should then be tightly enclosed to retain the moisture and left for germination. Care should be exercised that the soil continues moist in order to supply the necessary water to germinate the seeds. The seeds should be sown about the time garden seeds would be planted.

After two or three weeks the seeds will begin to germinate and at that time need careful attention. Up to this time it has been necessary to produce moist, humid conditions in the seed bed, but as soon as germination takes place it will be necessary to reverse the conditions and full ventilation and dry surface soil will be necessary in order to prevent "damping off." This is the most serious difficulty in seed bed work. It is a fungus disease which destroys the tissues at the surface of the soil and the trees apparently wilt, but as a matter of fact are suffering from this disease. The best remedy is prevention effected by removing any unnecessary dampness. Just as soon as germination has been secured all the covering used to conserve moisture during the germination period should be removed and from that time on during the remainder of the first season only half shade of lath should be used.

The beds should be carefully watched during the season. All weeds should be removed when small and the weeding done often. In case of dry weather, water should be applied late in the afternoon. Late in the summer the wire covering and lath shades should be removed to "harden" the trees for winter. In early winter, after a few inches of snow has fallen, the beds should be covered with one thickness of burlap over the snow.

*Detailed information in regard to the construction of such boxes will be found in Bulletin No. 76, Forest Service, Washington, D. C.

SEED BED NURSERY AT LAKE CLEAR JUNCTION, NEW YORK, CONTAINING THREE MILLION SEEDLINGS IN TWO ACRES

THE STATE OF NEW YORK NURSERY AT PALAMANCA

REFORESTATION IN MASSACHUSETTS

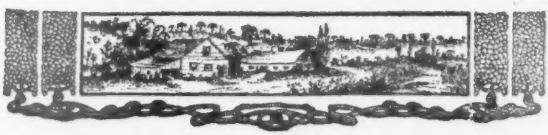
THE FOUR STEPS IN PLANTING A SEEDLING

The coming spring after the danger from "heaving" of the soil has passed the burlap should be removed. During the summer the beds should be kept free from weeds and freely supplied with water. The two-year-old beds do not need covering during the winter.

When the seedlings are two years old they are suitable for planting in the field, where there is but limited shade, and upon fair quality of soil. If larger and stronger trees are necessary they should be transplanted in the nursery. The seedlings should be taken up carefully in order not to injure any roots and the roots at all times kept from exposure to sun or wind. The transplant beds should be about seven feet wide and any length, but fifty feet has been found convenient. The paths should be two feet wide and the beds almost four inches higher than the paths. The "Yale Planting Board," invented by Prof. J. W. Toumey, has proved a most valuable tool and greatly reduced the cost of transplanting. The work with this board is carried on with five men in a crew using two boards. The board consists of two strips hinged by arms at right angles, one of them continuously notched the space the trees are to be apart in the rows. In this the trees are placed and upon it the other closes, holding them in place. Two men are employed digging the trench, two placing the seedlings in the boards and one man carries the board to and from the trenches. While two are filling the boards, two others are making the trenches into which the fifth man places the board filled with trees, then the soil is packed around the roots and the board removed. The trees are placed rapidly and regularly and the roots in normal position. The trees should be three inches apart in the rows and the rows six inches apart. This process is continued until the transplanting is completed.

The care during the season consists chiefly in weeding and watering in times of continued dry weather. A careful watch should be kept for insect pests or ground grubs. If the trees are not sufficiently large at the end of the one season in the transplant bed, they may be retained there another season.

When the trees are ready for field planting they should be carefully taken up to prevent any injury to the roots, promptly "heeled in" and finally planted as soon as possible. Spring planting is, as a rule, more desirable than fall planting. The trees, if shipped even a short distance, should be carefully packed in order to prevent any drying of the roots. If shipped a long distance they should be packed right, the roots packed in moss and sufficient openings left around the upper parts to prevent heating.



REFORESTATION IN MASSACHUSETTS

By F. W. RANE,
State Forester of Massachusetts.

AS a result of the educational campaign carried on by the Massachusetts Forestry Department there has been a general awakening on the part of the public, especially land owners, to the opportunities which this field affords for profitable investment and future development by reforestation in the Bay State. This widespread interest has been manifested during the past year by the great number of requests that have been made by clubs, granges, boards of trade, and other organizations throughout the state for lectures on this subject, as well as innumerable requests received by mail for literature treating of the subject. The press has also been no small factor in urging upon the people the importance of reforestation.

It must be quite obvious to every thinking person that to a state whose present stock of woodland is second and third growth, most of it consisting of sprouted trees which never become timber size, and which has nearly a million acres of land which may properly be classed as waste land, largely abandoned rough fields and so-called natural pastures growing up to brush, reforestation becomes a question of vital interest. Even forty or fifty years ago there were far-sighted men in Massachusetts who predicted the total extinction of our timber supply unless remedial measures were taken in season to prevent it, and quite a strong feeling pervaded the state in favor of planting commercial trees, but with the decline in farm values the enthusiasm abated, not, however, until fifteen or twenty small plantations had been set out by individuals in their private capacity. These plantations were small, of course, averaging ten to twenty-five acres.

As the white pine is a natural conifer of Massachusetts, a tree of comparatively rapid growth, and especially adapted to the soil of this region with its lumber in great demand, it is very natural that it should be given preference over all others in the work of reforestation. In fact, the first work of importance done by the present state forester after taking charge of the forestry work in this state was to make a study of its growth, with the result that in "Forest Mensuration of White Pine," a bulletin published under his direction, are to be found fairly complete data concerning the white pine. This bulletin shows, for instance, that the age at which a plantation should be cut to yield the highest net returns is 50 years, and that an acre of pine planted on average soil will produce at the rate of 900 board feet, or more, per year. This information is of great value to farmers, as it makes clear to them how the waste land of farms may be utilized and made to become of constantly increasing value. Supposing the value of land at the time of planting to be $6.00 per acre, the cost of planting $10.00, taxes at two per cent, an acre of pine will yield four per cent on the money invested, and $270 besides, a total of between six and seven per cent. These figures are based on the present prices of lumber, and not the probable prices fifty years hence.

WHITE PINE SEEDLINGS, SET FIVE YEARS, ABOUT THE WACHUSET RESERVOIR OF THE METROPOLITAN WATER SYSTEM.

A PINE PLANTATION THIRTY YEARS OLD ON THE SANDS OF CAPE COD

REFORESTATION IN MASSACHUSETTS

MASSACHUSETTS STATE NURSERY AT AMHERST; TRANSPLANTS IN FOREGROUND

A HEALTHY WHITE PINE STAND AT SUDBURY, MASSACHUSETTS. PLANTED THIRTY-EIGHT YEARS.

THE MASSACHUSETTS STATE FORESTER'S MEN AT WORK PLANTING.

Money Yield Table.

Manufactured and stumpage values.

Age (Years).	Quality I.					Quality II.					Quality III.				
	Volume.	Per M. Ft.	F. O. B. Value.	Per M. Ft.	Stumpage.	Volume.	Per M. Ft.	F. O. B. Value.	Per M. Ft	Stumpage.	Volume.	Per M. Ft.	F. O. B. Value.	Per M. Ft.	Stumpage.
	Bd. Ft.					Bd Ft.					Bd. Ft.				
25, . .	10,825		$173 20		$85 00	6,750		$108 00		$40 50	3,975		$63 60		$23 85
30, . .	19,900	$16 00	318 40	$6 00	119 40	12,500	$16 00	200 00	$6 00	75 00	7,500	$16 00	120 00	$6 00	45 00
35, . .	31,150		498 40		249 20	24,400		439 20		195 20	16,950		271 20		101 70
40, . .	40,650		791 70	$3 00	325 20	32,800		590 40	$3 00	262 40	25,200		403 20		201 60
45, . .	49,350	$18 00	888 30		394 80	40,600	$18 00	730 80		324 80	32,100		577 80	$3 00	256 80
50, . .	55,150		992 70	$10 00	551 50	46,500		837 00		465 00	37,550		676 00		300 40
55, . .	59,650		1,193 00		596 50	50,550		910 00	$10 00	505 50	42,100	$18 00	757 80		336 80
60, . .	63,600	$20 00	1,272 00	$12 00	763 20	53,200	$20 00	1,064 00		532 00	44,550		802 00	$10 00	445 50
65, . .	67,050		1,341 00		804 50	56,600		1,132 00		566 00	46,150		830 70		461 50

The legislature, within the past five years, has recognized the immense possibilities of forestry as a factor in adding to the wealth of the state, and has enacted several laws based upon recommendations of the state forester, intended to advance it. The reforestation act of 1908 has enabled the state forester to make a most promising beginning, about forty separate plantations covering 2,000 acres at an average cost of less than $10.00 per acre having already been made. Much of this land was acquired by the commonwealth under the provisions of the law which allows owners to turn over land to the state for the purpose of reforestation, reserving the right to redeem the land at any time within ten years, for the actual amount expended. Nearly fifteen hundred acres of land are now in the hands of the state forester ready for planting next season.

Previous to this year most of the trees planted were purchased from nurserymen, but last spring our nursery at Amherst, established three years ago, supplied about half of the one million seedlings used, and henceforth will furnish a large percentage of those required. This nursery, which is on the grounds of the Massachusetts Agricultural College, covers seven and one-half acres, and has in stock about two million pine seedlings, one half million Norway spruce, and several hundred thousand other species. Another nursery has been laid out at Sandwich on Cape Cod, but so far only one-half an acre has been utilized.

The plantations scattered all over the state have been of great interest to property owners, and have done much toward stimulating private enterprise along this line. The records at the office of the state forester show that in addition to the 2,000 acres planted under his direction, 2,000 acres have been planted by private parties and 1,500 by other agencies, principally the Metropolitan Water and Sewerage Boards.

So gratifying has been the progress made in the work of reforestation up to the present time, and so wide are the possibilities in this direction that a much larger appropriation has been asked for this year in order that operations along this line may be greatly extended.

THE PASSAGE OF THE APPALACHIAN BILL

ON THE 15th of February the long struggle for national legislation looking to the perpetuation of the forests of the Southern Appalachian and White Mountains was ended when the bill known as the Weeks, or Appalachian bill, was passed by a vote of 58 to 9. As it had been passed by the House in June of last year and was enacted by the Senate without change, it only remains for it to receive the signature of President Taft to become a law.

Between twelve and one o'clock, immediately at the close of the morning hour, the bill was called up by Senator Brandegee of Connecticut, who had it in charge. Senator Stone of Missouri, who had offered an amendment, withdrew it. Senator Brandegee then reviewed the legislative history of this bill in the Senate and the bill was read. The Senator from Connecticut made a brief and admirable opening statement and answered several questions, after which Senator Burton of Ohio addressed the Senate for over two hours in opposition to the bill. During this time he adduced nothing new. The Senator's secretary sat beside him with a ponderous array of volumes, pamphlets and documents, but his arguments and citations, which were numerous, were the old familiar ones which have been answered again and again.

Senator Newlands of Nevada spoke about an hour. He explained that he was in favor of the bill and desired its passage, but that his purpose in opposing it in its present form at the last session was "not to defeat the bill, but to anchor it more firmly in the interstate commerce power of the Constitution, and enlarge its area so as to provide a comprehensive scheme of legislation that would involve the regulation of the flow of all the navigable rivers of the country in aid of navigation, and accomplish that ultimate object by the storing of the flood waters of these rivers, including the sources of streams for purposes of irrigation and power; by the protection of forested areas included within the watersheds of such rivers and their sources, so as to prevent precipitate run-off and safeguard against denudation and erosion; by the protection of the river banks by revetment and levees, so as to confine the rivers to their channels, and thus aid in the reclamation of vast areas of swamp and overflowed lands within the drainage basins of such rivers containing an alluvial soil of enormous fertility and requiring only protection from flood waters to insure their highest agricultural development." He further explained that since there seemed to be a well grounded fear that the pressing of amendments at this time would endanger the passage of the bill, which he did not wish to do, he should withdraw his amendment and seek to accomplish his object through a more comprehensive piece of legislation at a later time. He summarized with much skill and clearness the arguments for the bill and devoted considerable time to the plan of a great national waterways system which is his special interest in legislation.

Mr. Newlands' position was a matter of gratification to friends of the bill because he has always been accredited a friend of progressive forestry legislation and it was a great disappointment to find him ranged apparently with opponents of this bill at the last session.

The next speaker was Senator Simmons of North Carolina, a long-time supporter of the various Appalachian forest bills. He made a carefully pre-

pared argument, reinforced by observations from his own state which is so largely interested in this question.

Senator Heyburn of Idaho, strengthened the case for the bill by his opposition. The point of his remarks was that this bill proposed to buy several counties entire, counties with a large population, of which he gave the figures, and turn them into solitudes. He denounced it is the "most radical piece of fancy legislation that has ever been proposed in the Congress of the United States."

Senator Smith of South Carolina, replied effectively to certain remarks of the Idaho Senator on the effects of erosion.

Senator Burton offered two amendments, the first providing for an examination of the lands to be purchased by the Engineer Corps of the United States Army instead of by the Geological Survey, and the second providing "that on lands acquired by the Commission timber shall be sold and water-power shall be granted only at prices and on terms approved by the National Forest Reservation Commission." Both amendments were rejected and roll calls were refused.

The roll call was then ordered on the passage of the bill and it was passed by a vote of 58 to 9. The vote concluded at about half-past five o'clock in the afternoon. The record was as follows:

Yeas—58

Bacon	Curtis	Lodge	Smith, Md.
Beveridge	Dick	Martin	Smith, Mich
Borah	Dixon	Newlands	Smith, S. C.
Bourne	duPont	Nixon	Smoot
Bradley	Fletcher	Oliver	Stephenson
Brandegee	Flint	Overman	Sutherland
Briggs	Foster	Page	Swanson
Brown	Frazier	Penrose	Taliaferro
Burnham	Frye	Piles	Taylor
Burrows	Gallinger	Perkins	Warner
Carter	Gamble	Richardson	Warren
Chamberlain	Guggenheim	Root	Watson
Crane	Jones	Scott	Wetmore
Crawford	Kean	Simmons	Young
Cummins	La Follette		

Nays—9

Bristow	Cullom	Gronna	Paynter
Burton	Davis	McCumber	Shively
Clark, Wyoming			

Not voting—24

Aldrich	Clark, Ark.	Heyburn	Percy
Bailey	Culberson	Johnston	Rayner
Bankhead	Depew	Lorimer	Stone
Bulkeley	Dillingham	Money	Terrell
Burkett	Gore	Nelson	Thornton
Clapp	Hale	Owen	Tillman

Of the Senators not voting all but four, Senators Hale, Lorimer, Nelson and Tillman, were placed on record by their pairs. These showed Senators Aldrich, Bulkeley, Burkett, Clapp, Depew, Dillingham, Johnston, Money, Rayner, Terrell and Thornton in favor of the bill, and Bailey, Bankhead, Clark of Arkansas, Culberson, Gore, Heyburn, Owen, Percy and Stone opposed.

There is evidence in this large senatorial majority in favor of the bill that its friends have been very successful in presenting the arguments for it during the last few weeks, because there was undoubtedly a much larger opposition to the measure some months ago than the vote shows at the present time. This is a matter for great congratulation. The bill was in charge of Senator Brandegee who has worked for its success faithfully and efficiently during the session. Closely associated with him on the floor was Senator

Gallinger, who has been actively in the service for this legislation since it was first proposed. For the final success much credit is due to the work of Senator Crane, whose wise counsel and service has always been available in its behalf. On the Democratic side Senators Chamberlain, Fletcher, and Overman have been particularly strong in their support. The text of the bill, as enacted, follows:

AN ACT

To enable any State to cooperate with any other State or States, or with the United States, for the protection of the watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the Congress of the United States is hereby given to each of the several States of the Union to enter into any agreement or compact, not in conflict with any law of the United States, with any other State or States for the purpose of conserving the forests and the water supply of the States entering into such agreement or compact.

SEC. 2. That the sum of two hundred thousand dollars is hereby appropriated and made available until expended, out of any moneys in the National Treasury not otherwise appropriated, to enable the Secretary of Agriculture to cooperate with any State or group of States, when requested to do so, in the protection from fire of the forested watersheds of navigable streams; and the Secretary of Agriculture is hereby authorized, and on such conditions as he deems wise, to stipulate and agree with any State or group of States to cooperate in the organization and maintenance of a system of fire protection on any private or state forest lands within such State or States and situated upon the watershed of a navigable river: *Provided*, That no such stipulation or agreement shall be made with any State which has not provided by law for a system of forest-fire protection: *Provided further*, That in no case shall the amount expended in any State exceed in any fiscal year the amount appropriated by that State for the same purpose during the same fiscal year.

SEC. 3. That there is hereby appropriated, for the fiscal year ending June thirtieth, nineteen hundred and ten, the sum of one million dollars, and for each fiscal year thereafter a sum not to exceed two million dollars for use in the examination, survey, and acquirement of lands located on the headwaters of navigable streams or those which are being or which may be developed for navigable purposes: *Provided*, That the provisions of this section shall expire by limitation on the thirtieth day of June, nineteen hundred and fifteen.

SEC. 4. That a commission, to be known as the National Forest Reservation Commission, consisting of the Secretary of War, the Secretary of the Interior, the Secretary of Agriculture, and two members of the Senate, to be selected by the President of the Senate, and two members of the House of Representatives, to be selected by the Speaker, is hereby created and authorized to consider and pass upon such lands as may be recommended for purchase as provided in section six of this Act, and to fix the price or prices at which such lands may be purchased, and no purchases shall be made of any lands until such lands have been duly approved for purchase by said commission: *Provided*, That the members of the commission herein created shall serve as such only during their incumbency in their respective official positions, and any vacancy on the commission shall be filled in the manner as the original appointment.

SEC. 5. That the commission hereby appointed shall, through its president, annually report to Congress, not later than the first Monday in December, the operations and expenditures of the commission, in detail, during the preceding fiscal year.

SEC. 6. That the Secretary of Agriculture is hereby authorized and directed to examine, locate, and recommend for purchase such lands as in his judgment may be necessary to the regulation of the flow of navigable streams, and to report to the National Forest Reservation Commission the results of such examinations: *Provided*, That before any lands are purchased by the National Forest Reservation Commission said lands shall be examined by the Geological Survey and a report made to the Secretary of Agriculture, showing that the control of such lands will promote or protect the navigation of streams on whose watersheds they lie.

SEC. 7. That the Secretary of Agriculture is hereby authorized to purchase, in the name of the United States, such lands as have been approved for purchase by the National Forest Reservation Commission at the price or prices fixed by said commission: *Provided*, That no deed or other instrument of conveyance shall be accepted or approved by the Secretary of Agriculture under this Act until the legislature of the State in which the land lies shall have consented to the acquisition of such land by the United States for the purpose of preserving the navigability of navigable streams.

SEC. 8. That the Secretary of Agriculture may do all things necessary to secure the safe title in the United States to the lands to be acquired under this Act, but no payment shall be made for any such lands until the title shall be satisfactory to the Attorney-General and shall be vested in the United States.

SEC. 9. That such acquisition may in any case be conditioned upon the exception and reservation to the owner from whom title passes to the United States of the minerals and of the merchantable timber, or either or any part of them, within or upon such lands at the date of the conveyance, but in every case such exception and reservation and the time within which such timber shall be removed and the rules and regulations under which the cutting and removal of such timber and the mining and removal of such minerals shall be done shall be expressed in the written instrument of conveyance, and thereafter the mining, cutting, and removal of the minerals and timber so excepted and reserved shall be done only under and in obedience to the rules and regulations so expressed.

SEC. 10. That inasmuch as small areas of land chiefly valuable for agriculture may of necessity or by inadvertence be included in tracts acquired under this Act, the Secretary of Agriculture may, in his discretion, and he is hereby authorized, upon application or otherwise, to examine and ascertain the location and extent of such areas as in his opinion may be occupied for agricultural purposes without injury to the forests or to stream flow and which are not needed for public purposes, and may list and describe the same by metes and bounds, or otherwise, and offer them for sale as homesteads at their true value, to be fixed by him, to actual settlers, in tracts not exceeding eighty acres in area, under such joint rules and regulations as the Secretary of Agriculture and the Secretary of the Interior may prescribe; and in case of such sale the jurisdiction over the lands sold shall, ipso facto, revert to the State in which the lands sold lie. And no right, title, interest, or claim in or to any lands acquired under this Act, or the waters thereon, or the products, resources, or use thereof after such lands shall have been so acquired, shall be initiated or perfected, except as in this section provided.

SEC. 11. That, subject to the provisions of the last preceding section, the lands acquired under this Act shall be permanently reserved, held, and administered as national forest lands under the provisions of section twenty-four of the Act approved March third, eighteen hundred and ninety-one (volume twenty-sixth, Statutes at Large, page eleven hundred and three), and Acts supplemental to and amendatory thereof. And the Secretary of Agriculture may from time to time divide the lands acquired under this Act into such specific national forests and so designate the same as he may deem best for administrative purposes.

SEC. 12. That the jurisdiction, both civil and criminal, over persons upon the lands acquired under this Act shall not be affected or changed by their permanent reservation and administration as national forest lands, except so far as the punishment of offenses against the United States is concerned, the intent and meaning of this section being that the State wherein such land is situated shall not, by reason of such reservation and administration, lose its jurisdiction nor the inhabitants thereof their rights and privileges as citizens or be absolved from their duties as citizens of the State.

SEC. 13. That five per centum of all moneys received during any fiscal year from each national forest into which the lands acquired under this Act may from time to time be divided shall be paid, at the end of such year, by the Secretary of the Treasury to the State in which such national forest is situated, to be expended as the state legislature may prescribe for the benefit of the public schools and public roads of the county or counties in which such national forest is situated: *Provided*, That when any national forest is in more than one State or county the distributive share to each from the proceeds of such forest shall be proportional to its area therein: *Provided further*, That there shall not be paid to any State for any county an amount equal to more than forty per centum of the total income of such county from all other sources.

SEC. 14. That a sum sufficient to pay the necessary expenses of the commission and its members, not to exceed an annual expenditure of twenty-five thousand dollars, is hereby appropriated out of any money in the Treasury not otherwise appropriated. Said appropriation shall be immediately available, and shall be paid out on the audit and order of the president of the said commission, which audit and order shall be conclusive and binding upon all departments as to the correctness of the accounts of said commission.

Passed the House of Representatives June 23 (calendar day, June 24), 1910.

Passed the Senate February 15, 1911.

EDITORIAL

THE APPALACHIAN BILL

THE passage by the Senate on Wednesday of the bill commonly known as the Weeks, or Appalachian, bill ends the first stage of a long struggle for national forests in the eastern mountains, a struggle that began in 1899. The bill now enacted bears little resemblance to those that preceded it up to the time of the Sixtieth Congress, although its purpose has been well understood to be the same, that is, the perpetuation of forests upon the great watersheds of the Appalachian ridge. It is a general law, providing for no particular locality, but there can hardly be a question raised as to its intent or as to the regions which are in present need of action by the nation.

Imperfect as it admittedly is, this new forest law marks a distinct step in advance, and may be said in some sense to be the beginning of a new departure in that it makes our national forest policy really national, although the application of the principle under the new law is greatly circumscribed. This aspect of the question is discussed in another connection.

Under its provisions much good may be accomplished in the nature of forest preservation and protection if it is broadly and generously interpreted by its administrators; but it has been frankly admitted by its advocates that it is acceptable only as a beginning and a means of testing the application of a most important economic principle.

As passed by the House last June, the bill carried an appropriation for the fiscal year ending June 30, 1910, of one million dollars, and for each succeeding year until 1915 of two million dollars annually, making an aggregate of eleven million dollars. Because of legislative conditions, it was necessary to pass the bill in the Senate without amendment and this provision was therefore unchanged. It is, therefore, probable that the first million dollars which was allotted for 1910 will be lost and that only ten million will be available for the purposes of the act. It is not certain, however, that the intent of the bill may not be considered and the full appropriation made available.

The passage of the bill is a notable triumph of enlightened public sentiment over political obstruction. Here was a measure which had the endorsement of three successive Presidents of the United States, of intelligent citizenship all over the land, as voiced by practically every great national organization that is working for the public welfare, by commercial and industrial bodies, by the federated women's clubs of America and an almost unanimous periodical and newspaper press. Notwithstanding such support as would seem to have assured its prompt enactment, it met in Congress from year to year a most stubborn opposition, directed by the leaders of the party organizations on both sides of the House. In the Senate there was a bitter sectional hostility from the northwest, which finally melted away leaving Senators Heyburn of Idaho and Clark of Wyoming, as its sole exponents. Notwithstanding its importance to the south, there was from that section a considerable opposition on the part of adherents of a strict, old-fashioned states rightsism, and the unfavorable influence of party leaders was strong in the middle

west. So far as evidence has appeared, this opposition in our national legislature has had no support outside of Congress, and it is remarkable that it has held out so long against an unusually broad, national and non-partisan public demand.

It is a weakness of the American people to develop great enthusiasms, embody them in law and then forget them, to become absorbed in their daily vocations and in fresh interests. This disposition has nullified many good laws. Let it be remembered in this hour of triumph that the ultimate success of this new forest law will depend upon the continued interest and intelligent support of those whose efforts have secured its enactment. In the face of public indifference it will become a useless instrument. Forcefully and intelligently sustained, it may be the beginning of greater good to the people of the whole country than even its most ardent friends have claimed.

ITS CONSTITUTIONAL ASPECT

THE new forest law in its present form must be regarded as partial, since it provides for maintaining forest cover only on drainage areas necessary for "conserving the navigability of navigable rivers." This is in deference to an opinion given by the Judiciary Committee of a former House of Representatives, and to the views of many constitutional lawyers as to the powers of the general government. We have always deemed it unfortunate that the discussion of this great public question was forced as a matter of expediency into so narrow a channel by the dictum of a political committee which is in no sense a judicial body, although made up of very able lawyers. Its members sit upon the committee as advocates rather than as judges in many cases, and this was especially true in connection with the Appalachian bill, which involved so many points of controversy and had aroused strong feeling. At the time that the opinion was rendered upon the Appalachian bill, several members of the committee, including its chairman, represented the spirit of intense hostility to the measure which guided the action of the leaders of the House organization. Under these circumstances we could hardly expect that an opinion would be rendered such as we should look for from the Supreme Court of the United States.

The views expressed by the committee are not unquestioned and we believe that time will teach the American people that an adequate timber supply, the preservation of the flow of streams for water power and the public health, and the sanitary influence of the mountain forests, are as necessary to the people as the navigability of their rivers, that is, that they are essential to the general welfare. In the debate last summer in the House no arguments for the bill were more gratifying than those of Mr. Mann of Illinois and General Keifer of Ohio, both of whom took a strong stand for the power of the general government to preserve our forests on the ground of the general welfare. Hoke Smith, Secretary of the Interior under President Cleveland and twice elected governor of Georgia, is on record with a similar declaration. None of these men is a radical, or a dangerous loose constructionist. They have with them many lawyers equally able and learned with those on the other side. It is the lesson of our whole history from the time of the Louisiana Purchase, made by the greatest of all the strict constructionists, that when a great national need has arisen, the provisions of the Constitution have been found to be ample to safeguard the nation. In academic constitutional discussions, the general welfare clause is but little regarded. When practical need arises, it is realized that the wise and cautious statesmen who debated almost every word of our great instrument of government, did not insert those words for mere verbiage. They knew what some lesser interpreters of the Constitution seem to forget,

that any such instrument, to be permanent, must provide for national growth and changing conditions. Nothing is more instructive in our history than the prophetic vision with which Washington, Jefferson, Marshall and others of our elder statesmen, looked forward through the years to the development of the nation they were founding. They would never have circumscribed that development by any provision which could have prevented the guarding of the people's welfare against any unfavorable conditions that might arise.

The nation that can purchase lands for national parks, as has been done several times, can purchase lands for national forests to maintain a permanent timber supply, protect our waterpowers and preserve the public health, whether such forests affect the navigability of navigable rivers or not. It was decided by the Supreme Court in the Gettysburg case that the national government could purchase land for the inculcation of patriotism. This was a broad interpretation, but one which need not cause terror in the heart of any citizen of the United States or admirer of the Constitution. It is distinctly in the line of the maintenance of national dignity and good citizenship.

Not to go back to old purchases of land in the early history of the country which have already been cited, to provide timber for the Navy, there are on record the following purchases of land within recent years which certainly do not come under the interstate commerce clause in any sense: Sully's Hill National Park, North Dakota, was purchased from the Devil's Lake Indians by virtue of an act dated April 27, 1904. Platt National Park was purchased from the Choctaw and Chickasaw Indians by authority of acts dated July 1, 1902, and April 21, 1904. The National Bison Range on the Flathead Indian Reservation was authorized by act dated May 23, 1908. By this act $30,000 was appropriated to enable the Secretary of the Interior to pay the confederated tribes for the land according to an act dated April 23, 1904. The same act provided ten thousand dollars for fencing the range and putting up buildings. An act dated March 4, 1909, provided $47,000 for the maintenance of the Montana Bison Range.

If the government can do these things with its money, it is idle to claim that it cannot spend it equally for lands in any of the states of the Union for the important economic purposes connected with forestry as understood in these modern times. The fact is, we strain at gnats and swallow camels in appropriation of money for national purposes, and whenever it suits legislators to oppose a measure which is otherwise meritorious, the cry of unconstitutionality is almost always resorted to. Notwithstanding all the agitation, argument, and education of recent years, we have much to learn as a people in regard to the economic importance and necessity of scientific forestry. This lesson is being rapidly learned, however, and when it is fully understood the resulting enlightenment will lead to a development of our forest policy which will not endanger the Constitution, but will give greater permanence to the nation, strengthen the United States treasury, and infinitely add to our resources as a people in the years to come.

PROFESSOR GLENN'S REPORT

THE comprehensive report of Professor L. C. Glenn on denudation and erosion in the Southern Appalachian region and Monongahela basin, which is briefly reviewed this month, comes most appropriately at this time when the long sought law making possible national action to preserve the forests of this region has been enacted. The report is a mine of information which will now be of the greatest service. Professor Glenn's first-hand knowledge on the subjects treated in the report has not been equaled by any

one, and the authority of his statements has not been successfully challenged. Here we have the expert testimony of a competent geologist, based on a long and patient reconnaissance on the ground, as to the actual soil conditions in these important drainage areas. The report has a direct bearing on the work of salvage and development now to be undertaken by the general government.

THE OWNERSHIP OF TIMBERLANDS

THE first part of the long awaited report of the Commissioner of Corporations on the lumber industry is a document of great interest. The facts which it presents are not new or surprising to those who were at all informed on the subject, although they probably are to the country at large. They show in a striking way the facilities which our public land methods have offered for the development of large, private holdings; that the government, in fact, has been engineering a magnificent get-rich-quick enterprise from which many men have naturally profited. It also points out the possible consequence in the future of development along the same line. This is what really concerns us as a practical problem. What is done cannot be undone. What is to be done is at least partially within our control.

The first deduction, and the only one to which we now wish to call attention, is the unanswerable argument that this large control of our timberlands by a few private holders makes for the maintenance on as large a scale as possible of national forests and of state forests in every state for the security of the people's interest by maintaining healthy conditions in the lumber industry. This is the only practicable check that can be put upon the power of great private owners.

AMERICAN CONSERVATION

THE new magazine announced sometime ago by the National Conservation Association has appeared for the month of February under the title American Conservation. It should be a valuable instrument for the association that publishes it in keeping its public in touch with various phases of the conservation work. We extend to it a cordial welcome and the best wishes of AMERICAN FORESTRY for wisdom to guide its course and power to enforce the great principles for which it stands.

CURRENT LITERATURE

REVIEWS

Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin. By Leonidas Chalmers Glenn. Department of the Interior, United States Geological Survey. Professional paper 72. Page 137, Washington, Government Printing Office, 1911.

This report, as stated in the introduction, presents "a brief summary of the results of an examination of the Southern Appalachian region during the field seasons of 1904 and 1905, and of the Monongahela Basin in West Virginia and Pennsylvania in 1907, made for the purpose of studying the effect of deforestation and consequent erosion of the steep mountain slopes on geologic, hydrologic and economic conditions, both in the mountain region itself and in the surrounding areas through which the many streams that rise in the high Appalachians flow on their way to the Mississippi, the Gulf or the Atlantic."

It will be seen from this statement how important a bearing this report has upon the subject of the preservation of the Appalachian forests which has been so much before the public and so much a matter of controversy during the last few years. Professor Glenn's method was closely scientific. He traveled from valley to valley through the southern mountains, noting and recording with great exactness hillside and mountainside wash and wear, soil removal by gullying and soil burial by overwash and stream overflow, the filling of millponds and the wrecking of dams and bridges, and numerous other evils that are attributed by many observers to reckless deforestation and injudicious attempts to cultivate slopes that are not adapted to agriculture. The report is liberally illustrated from photographs that show in the most graphic manner the conditions described. His studies included parts of eight states, Pennsylvania, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Tennessee and Alabama. Professor Glenn holds that the problems studied by him from the standpoint of the geologist must be solved by methods that relate chiefly to forestry and to agriculture. The agricultural problem involves the selection of the areas best suited for agriculture because of fertility and character of soil and moderate slope of surface, and the study of the ways in which such areas may be handled to prevent their own destruction through erosion, as well as the destruction of other lands and property by the waste material they deposit and the floods they help to generate. Among other facts noted in the course of his study was the interesting one that steep slopes formed of certain rocks can be safely cultivated, while others no steeper, composed of other rocks, were cultivated with disastrous results.

Much of the area examined is not suitable for agricultural land and should not be cleared and forced into agricultural use, because that forcing means destruction both of the area itself and of the lower-lying areas on the same stream. Such misuse means also slower but none the less sure interference with navigation on the more remote parts of the major stream system.

The report describes the physical features of the country examined, discusses the relation of industries to erosion and denudation, taking up in succession agriculture, lumbering, mining, and power development. The nature, effect and remedies of erosion are considered and several pages are given to a discussion of the debated subject of changes in stream regimen. Professor Glenn says that "the forester would protect steep slopes by keeping them clothed with timber, coax back tree growth on denuded areas, keep down forest fires, protect and perpetuate the supply of hard wood, protect the game and fish, and enhance the beauty and charm of the region as a health and pleasure resort, as well as prevent the navigable streams that flow from these mountains from filling up with the sand and silt whose removal is now costing annually large sums of money."

Then follows a study of the details of conditions in the region, prefaced by a description of the method of treatment. This, with a table of streams and the index, occupies the remaining hundred pages of the report.

We shall probably have occasion from time to time to make use of the facts in this report, which is a valuable reference volume and should be near the hand of everyone who is engaged in the study of the problems connected with these mountains. It can be obtained by application to the Director of the Geological Survey.

MONTHLY LIST FOR FEBRUARY, 1911

(Books and periodicals indexed in the Library of the United States Forest Service)

Forestry as a Whole

Forbes, A. C. The development of British forestry. 274 p., pl. London, England, E. Arnold, 1910.

Schermbeek, A. J. van. Einige leitsätze bezüglich der forstwissenschaftlichen forschung. 30 p., il. Bruxelles, Ch. Bulens, 1910. (Internationaler verband forstlicher versuchanstalten. Publication.)

Forest Education

Forest schools

India—Imperial forest college, Dehra Dun. Progress report for 1909-1910. 23 p. Calcutta, Supt. of government printing, 1910.

India—Imperial forest research institute. Progress report for 1909-1910. 25 p. Calcutta, Supt. of government printing, 1910.

St. Petersburgh—Lyesnoi institut (Forest institute). Izvyestiya (Contributions), vol. 20. 152 p. St. Petersburgh, 1910.

Forest Legislation

Zaleman, Nikolai, comp. Lyesnoi ustav (Forest laws). 2 volumes in 1. St. Petersburgh, 1910.

Forest Description

Hutchins, D. E. Report on Cyprus forestry. 93 p., pl., fold. map. London, Waterlow & Sons, l't'd., 1909.

Forest Botany

Deutsche dendrologische gesellschaft. Mitteilung, no. 19. 410 p. il. Bonn-Poppelsdorf, Germany, 1910.

Jepson, Willis Linn. The silva of California. 480 p. Berkeley, Cal., 1910. (University of California. Memoirs, vol. 2).

Maiden, J. H. The forest flora of New South Wales, pt. 41. 20 p. pl. Sydney, Govt. printer, 1910.

Winkenwerder, Hugo. Short keys to the more important trees and shrubs of Oregon and Washington. 8 p. Seattle, Wash., University of Washington.

Silvics

Forest influences

Glenn, Leonidas Chalmers. Denudation and erosion in the southern Appalachian region. 137 p. pl., maps. Wash., D. C., 1911. (U. S. Geological survey. Professional paper 72.)

Studies of species

Vadas, Eugène. Die bedeutung der robinie (Robinia pseudacacia) für die forstwirtschaft Ungarns. 18 p. pl., diagr. Selmecbánya, Hungary, J. Agost özv. és Fia, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Zederbauer, Emmerich. Zusammenfassung der resultate über die in Mariabrunn ausgefuhrten versuche betreffend weissföhren verschiedener provenienz. 2 p. Mariabrunn, Austria, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Seeds

Crahay, N. I. La question des semences en sylviculture. 14 p. Bruxelles, F. van Buggenhoudt, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Engler, Arnold. Influence de la provenance des graines du pin sylvestre; recapitulation des résultats obtenus jusqu'ici par la Station suisse de recherches forestières. 14 p. Bruxelles, Ch. Bulens, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Forest soils

Bühler, Anton. Untersuchungen über die bildung von waldhumus. 70 p. Stuttgart, E. Ulmer, 1900. (Würtembergische forstliche versuchsanstalt. Mitteilungen, 2. heft.)

Roth, Jules and Zemplén, Géza. Beiträge zur stickstoffaufnahme des waldes. 20 p. Bruxelles, F. van Buggenhoudt, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Vater, H.
Die erforschung des zulangens der nährstoffe im waldboden. 7 p. Bruxelles, Ch. Bulens, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Forest fertilizing

Grahay, N. I. and Durieux. L'emploi des engrais chimiques en sylviculture; résultat des expériences. 31 p. pl. Bruxelles, F. van Buggenhoudt, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Schwappach, Adam. L'emploi des engrais dans la grande culture forestière. 14 p. Bruxelles, Ch. Bulens, 1910. (Internationaler verband forstlicher versuchanstalten. Publication.)

Verstraete, O. Plan-type de champs d'expériences à établir sur l'emploi des engrais en sylviculture. 14 p., diagr. Bruxelles, L. Pternotte, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Forest experiment stations

Sweden—Forstliche versuchsanstalt. Mitteilungen, heft 7. 238 p. il. Stockholm, Sweden, 1910.

Forest Protection

Insects

Chittenden, F. H. The oak pruner. 7 p. il. Wash., D. C., 1910. (U. S. Dept. of agriculture, Bureau of entomology. Circular 130.)

Diseases

Mayr, Heinrich. Schüttekrankheit und provenienz der föhre (kiefer). 11 p. München, Kastner and Callwey, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Fire

MacMillan, H. R. and Gutches, G. A. Forest fires in Canada. 40 p. il. Ottawa, 1910. (Canada, Dept. of the interior, Forestry branch. Bulletin 9.)

Forest Management

Poskin, Arthur. Conversion des peuplements purs d'épicéa en peuplements mélangés. 14 p. Bruxelles. F. van Buggenhoudt, 1910. (Internationaler verband forstlicher versuchstanstalten. Publication.)

Quairière, C. J. Des mélanges d'essences feuillues a réaliser dans les futaies de hêtre. 13 p. Bruxelles, F. van Buggenhoudt, 1910. (Internationaler verband forstlicher versuchsanstalten. Publication.)

Statistics

United States, Bureau of the census. Crossties purchased, 1909. 11 p. Wash., D. C., 1911. (Forest products, no. 8.)

United States, Bureau of the census. Pulpwood consumption, 1909. 15 p. Wash., D. C., 1911. (Forest products, no. 1.)

Forest Administration

British Columbia, Royal commission of inquiry on timber and forestry, 1909-1910. Final report. 116 p. il., pl., diagr., fold. map. Victoria, B. C., 1910.

Canada, Dept. of the interior, Forestry branch. Report of the Supt. of forestry, 1909-1910. 77 p. pl. Ottawa, 1910.

Maine, Forest commission. Eighth report. 111 p. il., pl. Augusta, Me., 1910.

New Hampshire, Forestry commission. Biennial report for the years 1909-1910. 105 p. pl., maps. Concord, N. H., 1910.

Philippine Islands, Bureau of forestry. Annual report of the director of forestry for the period July 1, 1909, to June 30, 1910. 25 p. Manila, P. I., 1910.

United States, Forest service. January field program, 1911. 34 p. Wash., D. C., 1911.

Wisconsin, State forester. Report for 1909 and 1910. 136 p. Madison, Wis., 1910.

Forest Utilization

Crumley, J. J. The relative durability of post timbers. 36 p. il. Wooster, O., 1910. (Ohio, Agricultural experiment station. Bulletin 219.)

Ricard, J. H. Au Pays Landais; exploitation des forêts résineuses. 252 p. il., map. Paris, J. B. Baillière et fils, 1911

Auxiliary Subjects

Irrigation

National irrigation congress. Official proceedings, 18th. 412 p. Pueblo, Colo., 1910.

Periodical Articles

General

Bulletin of the Pan American union, Jan., 1911.—Cocoanuts in the Americas, by Charles Melville Brown, p. 23.

Canadian century, Jan. 7, 1911.—Further reciprocity in timber products unnecessary, by H. R. Macmillan, p. 10.

Collier's weekly, Dec. 17, 1910.—Exploring the Philippine forests, by C. A. Gilchrist, p. 14.

Country life in America, Jan., 1911.—Our native trees; the red cedar, by A. O. Huntington, p. CXCIV, CXCVI.

Field and stream, Nov., 1910.—European forestry, by W. H. Miller, p. 618-23.

Illustrirte zeitung, Nov., 1910.—Die höheren forstlichen bildungsstätten in Deutschland, österreich, Ungarn und der Schweiz, by A. Remelé, p. 21-4.

Muhlenbergia, Nov., 1910.—The limber pine, by A. A. Heller, p. 128-32.

Plant world, Dec., 1910.—Notes on growth of pine seedlings, by J. C. Blumer, p. 296-7.

Proceedings of American society of civil engineers, January, 1911.—Timber preservation, its development and present scope; discussion, by R. Lamb and J. M. Schreiber, p. 141-51.

Progress magazine, Dec., 1910.—Conservation of the Christmas tree, by Catherine Frances Cavanagh, p. 9-12.

Rural spirit, Jan. 25, 1911.—Live stock grazing as insurance against forest fires, by D. P. Smythe, p. 3-6.

Scientific American, Jan. 7, 1911.—Breeding successful strains of basket willows, p. 20-1.

Scientific American, Jan. 21, 1911.—Draining the Everglades, by D. A. Willey, p. 67.

Torreya, Jan., 1911.—Additions to the tree flora of the United States, by J. K. Small, p. 11-14.

Trade journals and consular reports

American lumberman, Jan. 14, 1911.—Felling trees with hot wires, by A. Scheible, p. 41; New source of pulp; efforts of the federal government to extend and

economize manufacture, p. 42-3; Wisconsin engaged in practical reforestation, p. 43; Strength, durability, adaptability of white oak, p. 1, 83.

American lumberman, Jan. 21, 1911.—Manufacture and use of lumber in China, by O. M. Clark, p. 36-7; To prevent waste; new process invented and in operation to conserve material in the manufacture of wood pulp, p. 39; Inspectors' work, by J. W. Martin, p. 56.

American lumberman, Jan. 28, 1911.—Logging yellow pine, by W. T. Whiteman, p. 41; largest government timber land sale; federal authorities dispose of over two hundred thousand acres in California, p. 44; Why natural reproduction is better than planting, by A. Akerman, p. 81; Conservation of the state's timber resources, by C. W. Fairbanks, p. 84-5; Cypress and its uses, by A. T. Gerrans, p. 85.

Canada lumberman, Jan. 1, 1911.—Passing of the square timber trade, p. 24-6.

Engineering and mining journal, Dec. 31, 1910.—Combination steel and wood mine timbers, p. 1293-4; Creosote as a timber preservative, p. 1295.

Engineering news, Dec. 29, 1910.—Repaving the "Loop" district in Chicago with creosoted wood block, by W. W. Marr, p. 718-22.

Engineering news, Jan. 5, 1911.—Marine wood destroyers in the waters of the South Atlantic ports, by W. D. Faucette, p. 12-13.

Hardwood record, Feb. 10, 1911.—Band sawing, by E. C. Marshon, p. 69-71.

Lumber trade journal, Jan. 15, 1911.—Economical stump destruction a problem, p. 27-9.

Municipal journal and engineer, Jan. 11, 1911.—Oil for preserving wood blocks, p. 54-5.

Municipal journal and engineer, Jan. 25, 1911.—Work of Buffalo's forestry dept., by H. B. Filer, p. 115-17; Creosoting wood blocks in England, p. 122.

Pacific lumber trade journal, Jan., 1911.—Possibilities of Pacific Coast logging by electricity, by F. Mackean, p. 45-6; Logging chances in national forests of Pacific northwest, by G. H. Cecil, p. 47-8; Our logged-off land problem and its solution, by C. J. Zintheo, p. 55-61.

Pioneer western lumberman, Jan. 15, 1911.—Cut-over lands west of the Cascade Mts., by G. H. Emerson, p. 13, 15.

Pioneer western lumberman, Feb. 1, 1911.—Patrol methods, telephone lines, trail building and supply depots, by D. P. Simons, p. 7.

Railway and engineering review, Jan. 21, 1911.—Depths of penetration in wood preservation, by D. Allerton, p. 44-5.

Railway journal, Feb., 1911.—Results obtained in prolonging life of railway tie, by F. J. Angier, p. 7-8.

Southern lumberman, Jan. 21, 1911.—Yellow pine from log to dry kiln and yard, by W. W. Warren, p. 31; Yellow pine drying in dry kiln and on yard, by F. R. Gilchrist, p. 32-3; Address on conservation in Louisiana, by H. T. Hardtner, p. 33-4.

Timberman, Jan., 1911.—Pioneer lumbering in Montana; story of early days graphically told, by A. M. Holter, p. 20-24; The climber locomotive, p. 29; Commercial opportunities in China for trade development and expansion, by O. M. Clark, p. 35-9; Portable tree felling machine, p. 48L; Lumber trade of Australia; large importations of American product, p. 52.

United States daily consular report, Feb. 2, 1911.—Foreign lumber in Natal, by E. S. Cunningham, p. 448.

United States daily consular report, Feb. 4, 1911.—White oak staves and timber in foreign countries, by J. I. Brittain and others, p. 465-70.

United States daily consular report, Feb. 10, 1911.—Paper in the far east, by G. E. Anderson and others, p. 549-50; Wood pulp and paper in Japan, by T. Sammons, p. 551.

United States daily consular report, Feb. 15, 1911.—Timbering in eastern Siberia, by L. Maynard, p. 618-21.

West Coast lumberman, Jan. 1911.—Tree felling machine, p. 195.

Wood craft, Feb. 1911.—English oak; its place, peculiarities and power, p. 154-6.

Wood worker, Jan. 1911.—The making of hardwood mantels, by G. D. Crain, p. 27; An electric tree-felling machine, by A. Scheible, p. 34-5.

Forest journals

Allegemeine forst- und jagd-zeitung, Dec. 1910.—Untersuchungen und betrachtungen über das verhalten der humusarten, by C. Emeis, p. 425-32.

American forestry, Feb. 1911.—Present forestry issues, by Curtis Guild, jr., p. 67-81; Shall states regulate the management of private forests, by H. H. Chapman, p. 82-8; City trees and their relation to forestry, by J. J. Levison, p. 91-8; American forestry association; 13th annual meeting in Washington, Jan. 12 and 13, 1911, p. 99-116; The forestry problem of to-day, by H. S. Graves, p. 111-14.

Canadian forestry journal, Dec. 1910.—Forestry for municipalities, by H. R. MacMillan, p. 99-104; Ontario's forest fires, by J. F. Whitson, p. 107-9; A uniform log rule for all Canada, by A. H. D. Ross, p. 110-13.

Centralblatt für das gesamte forstwesen, Nov. 1910.—Ueber das wesen des waldkapitales und über die ermittlung von durchschnittlichen waldrenten, by A. Schiffel, p. 475-85; Neues aus der naturgesschichte des maulwurfes, by F.

Knauer, p. 485-92; Moosdecke und holzzuwachs, by Böhmerle, p. 523-6; Vorgänge bei der holzverkohlung in meilern und bei der trockenen destillation des holzes, by F. Denz, p. 526-48.

Forest leaves, Feb. 1911.—Some recent phases of the forestry problem, by J. T. Rothbrock, p. 8 14.

Forestry quarterly, Dec. 1910.—Two new insect pests in Nebraska, by L. Bruner and M. H. Swenk, p. 411-14; The progress of reconnaissance, by A. B. Recknagel, p. 415-18; Determination of quality of locality by fiber length of wood, by C. D. Mell, p. 419-22; Exploiting telegraph poles in Colorado, by A. T. Upson, p. 423-6; A comparison of Maine and Blodgett log rules, by I. G. Stetson, p. 427-32; Water powers in the northwest, by W. E. Herring, p. 433-8; Forestry in Ohio, by E. C. Hirst, p. 439-49; New Jersey forests and forestry, by D. E. Lyon, p. 450-61; Height and dominance of the Douglas fir, by T. C. Frye, p. 465-70; Forest and soils of Caldwell parish, Louisiana, by J. A. Larsen, p. 462-4.

Forstwissenschaftliches centralblatt, Jan. 1911.—Schüttekrankheit und provenienz der föhre, by H. Mayr, p. 1-14; Ueber düngung im forstlichen betriebe, by Helbig, p. 40-2.

Hawaiian forester and agriculturist, Jan. 1911.—The part played by the forest in conservation, by R. S. Hosmer, p. 10-13.

Indian forest records, 1909.—The sylviculture of Hardwickia binata, by D. O. Witt, p. 75-135; Germination and growth of sandal seedlings, by R. S. M. Rama Rao, p. 137-57.

Ohio forester, Jan., 1911.—A rare and dangerous disease of pine trees, by B. Fink, p. 5; Planting forest tree seedlings, by H. C. Rogers, p. 5-7; A plan for the treatment of the woodlot of Eugene Cranz, by E. Secrest, p. 7-10; Forestry as a profession, by C. H. Goetz, p. 11-12.

Quarterly journal of forestry, Jan. 1911.—The roadside poplar in Belgium, by E. R. Pratt, p. 3-9; Forests of the far west, by H. R. Beevor, p. 9-17; Valuation of standing timber, by W. Forbes, p. 17-27; The oak forests of Sclavonia, by H. J. Elwes, p. 27-34; Some measurements of larch in the Forest of Dean and neighborhood, by C. O. Hanson, p. 34-42; Acclimitization of trees, by W. R. Fisher, p. 42-4; Sixth conference of the International union of forestry experimental stations, by W. Somerville, p. 45-8; Royal English arboricultural society's excursion to Ireland, 1910, p. 49-68; Mr. W. R. Fisher, p. 79-83.

Revue des eaux et forêts, Dec. 1, 1910.—Un nouvel ennemi du mélèze, by E. Henry, p. 705-10; Les bois de lutherie à Mirecourt, Vosges, by Claudot, p. 710-13.

Revue des eaux et forêts, Dec. 15, 1910.—Le jardinage est-il rentable, by A. S., p. 737-8.

Revue des eaux et forêts, Jan. 1. 1911.—Les forêts de l'arrondissement d'Albertville, by D. Mourral, p. 1-20.

Schweizerische zeitschrift für forstwesen, Dec. 1910.—Die hagelfrequenz in der Schweiz, by J. Mauer, p. 345-52; Weiche und harte bedachung, by F. Fankhauser, p. 358-65.

Zeitschrift für forst- und jagd-wesen, Dec. 1910.—Die witterung in Eberswalde im jahre 1909, by J. Schubert, p. 722-9; Forstliche buchführung, by Kautz, p. 749-54; Der Werdauer wald im 16, jahrhundert, by F. Tetzner, p. 757-770.

NATIONAL FOREST WORK

The Resignation of District Forester Chapman

C. S. Chapman, district forester of District 5, United States Forest Service, has resigned from the Service to become secretary of the Oregon Forest Fire Association. He is succeeded as district forester by George H. Cecil, formerly associate district forester. In one sense Mr. Chapman's resignation is a loss to the Forest Service and to the government. In another it is a gain, for he carries into his new field of work the principles and methods of the Service and through him these are really extended over a broader field. It is worthy of note that when these large associations of lumbermen in the Northwest undertake to deal with this problem of fire protection and forestry on a large scale, they select men from the Forest Service to take charge of the work. This is not only a high compliment to the efficiency of the Service and the value of its work, but it is the best possible answer to the criticisms of the Service that are so frequently made by politicians and others in that section of the country. Mr. Chapman entered the Forest Service in 1900 when not over a dozen men were employed in its work. He, therefore, represents all the best traditions which have grown up in the Service.

Grazing Examiners

Examinations, which were held February 23 and 24 for three grazing examiners for the Forest Service, indicate the establishment of a new position in the Service. These positions will pay a salary of twelve hundred dollars a year at entrance. The applicants must be at least twenty years old and possessed of not less than one season's experience in handling range stock, together with one year of technical training in specialized botanical study. Through the work of these examiners it is intended to make every acre of national forest range produce as much forest as it is capable of doing, consistently with the carrying out of the other purposes for which the national forests are maintained. In times past the ranges have been abused by overcrowding. To enable overgrazed areas to recuperate and to prevent the extension of overgrazed conditions in new areas, the amount of stock was everywhere carefully prescribed. The results were then observed and if it appeared that there was still over-use of the range, the numbers were cut down still further. On the other hand, where recuperation had taken place the allowance of stock was correspondingly increased. Through the appointment of trained botanists and men of practical experience, the best scientific knowledge will be applied to the study of the problems of forage production and utilization in the forests. It is hoped by the introduction of new forage plants to increase the area of range available.

National Forest Fire Losses and Range Use

The final reports by national forest officers of their examination of lands burned over in the forest fires of last summer in Washington and Oregon show that the national forest timber loss in these states is about 700,000,000 feet, somewhat less than was indicated by the estimates made shortly after the fires. Of the forests in these states that on which the fires extended over the greatest area was the Colville, where 160,000 acres were burned. These fires were chiefly surface fires which are far less destructive than fires which travel through the crowns of the trees. It is considered by the forest officers that the fires in this forest show the value, from the standpoint of fire prevention, of proper utilization of the range under regulated grazing. Large parts of this forest and also of the Chelan, Okanogan and other forests are not used by stock because of their inaccessibility. The dry grass and other herbage both spread the flames and made them fiercer and more destructive than they would have been if the land had been grazed. One of the objects of national forest administration is to open all available range to the fullest use consistent with the preservation and protection of forest growth and water supply.

An Eucalyptus Experiment

The rangers of the United States Forest Service, under the direction of F. M. Grant, are to make an experiment in the planting of eucalyptus in the southern California foot-hills. One hundred thousand trees of selected and hardy varieties are to be set out where they cannot be irrigated and will be left to shift for themselves. This is wholly an experiment and represents an effort to put into use large areas of soil that is proven to be fertile by its perennial crop of undergrowth but is useless for any ordinary purposes because of its rough-

ness and inaccessibility. The trial plantings are to be made on about seventy acres in the bottom of little Tujunta canyon, northwest of Sunland, one hundred acres in the foot-hills beyond Del Rosa in San Bernardino County, and about fifty acres in Santa Ana canyon.

The Experimental Wood Pulp Mill

The experimental ground wood pulp mill which the United States Forest Service has been equipping at Wausau, Wisconsin, in cooperation with the American Pulp and Paper Association, has begun to grind. The carrying on of the tests now announced as under way was provided for by a special appropriation, placed at the disposal of the Secretary of Agriculture by Congress last winter, to conduct tests of the suitability for paper making of plants and woods which seem likely to become valuable sources of supply of new material.

Secretary Wilson considered that the best use which could be made of this money would be to conduct experiments on a commercial scale, with various kinds of wood. Some of these have already been studied in the laboratory, and found to be intrinsically suitable for pulp manufacture. Indeed, the Forest Service has actually made paper by one of the chemical processes from several of them. But in order to know whether they can profitably be utilized, under present conditions, it is necessary to test them under methods of manufacture comparable to those employed in actual business operations. In particular, it is desired to find out to what extent new woods can be used for ground pulp, the cost of which is usually less than that of chemical pulp.

The Wausau mill has been built especially for the use of the government as long as the experiments may require. Its inside dimensions are 40 by 100 feet, and it is equipped with electrical machinery and all necessary apparatus of the most up-to-date type. Part of the equipment is contributed by the American Pulp and Paper Association, and part is furnished by the government. The association will also furnish the wood for the tests. The wood now on hand includes carload lots of jack pine, spruce, hemlock, and tamarack. The jack pine is to be the first wood tested.

While the experiments are intended to cover woods from all parts of the country which, from the standpoint of physical properties and available supplies, promise to furnish new material for the paper-making industry, a special point will be made of tests of Western woods which are abundant in the national forests. There are enormous supplies of various softwoods in these forests for which there now exists little demand. In order to have forests produce timber steadily they must be cut; but if there is a market only for timber from the most valuable kinds of trees the result of cutting is likely to be the disappearance of these trees and their replacement in the forest growth by species which are not in demand. Since the pulp mills take material too small for the lumber mills, species suitable for paper making can be cut to a low timber diameter, and thus the balance may be turned in favor of the reproduction of the more valuable kinds of trees.

In addition to the benefit which the public will derive from the advancement of forest conservation in consequence of the wood pulp experiments of the government, there is the further benefit of cheaper paper which it is believed these experiments should make possible.

Boundary Changes

Recent announcements of additions to and eliminations from national forests, are as follows:

Forest	State	Add. Acres	Elim. Acres
Ozark	Arkansas	.....	563,331
Kern	California	.....	33,526
Lassen	California	38,709	6,107
Monterey	California	7,690	21,527
Boise	Idaho	.....	9,940
Alams	New Mexico	245,450	22,333
Sevier	Utah	93,730	2,560
		385,579	659,324

STATE WORK

The Year's Forest Legislation in Vermont

By A. F. Hawes, State Forester.

The Vermont Legislature of 1910 has on the whole taken a progressive stand in forestry matters, and as indicative of the growing sentiment throughout the State in favor of forestry, this is especially encouraging. The law of 1908 creating the office of state forester, appropriated $12,000 annually for the departments of agriculture and forestry. By increasing this appropriation to $20,000 the new legislature virtually stamped its approval upon the forestry work of the first two years. These funds are divided between the two departments by the State Board of Agriculture and Forestry; and the amount alloted to forestry was $9,000 in 1909; and $7,500 in 1910. The increasing demands upon the Commissioner of Agriculture will make it impossible for the board to grant as large a proportion of the new appropriation to forestry, but it is hoped that at least $12,000 will be available, which would allow about $5,000 for the purchase and planting of demonstration forests in various parts of the state, and in the improvement of the fire warden service made possible another bill passed by this legislature. The strongest supporter of the forestry movement in the legislature was Hon. Allen M. Fletcher of Cavendish, chairman of the Ways and Means Committee and for a long time an active member of the Vermont Forestry Association.

The amendment of the present fire warden law provides that in addition to the first selectman, who is at present fire warden, the state forester has authority to appoint additional wardens in mountainous towns particularly liable to fires; and to pay their expenses to local meetings for the discussion of forest fire topics. It also provides that if any forest owner will establish a lookout station on top of a mountain and connect the same with telephone, that the state will maintain a watchman there during a dry season. An amendment was added in the House compelling any railroad to establish a fire patrol at the request of the state forester in danger seasons, with a penalty of $25 a day for disobedience. This was killed in the Senate by the Boston and Maine R. R.; and while it would not have worked a hardship on any railroad, it is of little importance since there are comparatively few railroad fires in Vermont.

In its enthusiasm for forestry the General Assembly passed one or two measures, the wisdom of which may be doubted but which illustrate very well the growing interest along this line. Such a measure was the bill reestablishing a bounty on porcupines. The last time this bounty was in force it resulted in an expenditure of several thousand dollars a year of state funds. Now the animals have been allowed to breed unmolested for several years and will be a profitable source of income for many hunters. While it must be admitted that porcupines do considerable damage to growing timber in certain regions, it probably does not compare in money value to that done by woodchucks and house rats, yet there is no state bounty on these animals.

One of the most curious forestry situations has been the growing opposition throughout New England to the Christmas tree industry. From Vermont about 300,000 trees have been shipped annually to Cincinnati, Cleveland, Pittsburg, Washington, and other points west and south. All of these trees could easily be grown in fifteen years on 300 acres, and yet coming as they do from many parts of the state they have attracted undue attention. Lumbermen and pulp men have made the most of it to distract attention from the damage done by them in cutting small trees, and the press has been energetic in its attacks. The result was that a law was passed without opposition requiring a dealer to pay a license of twenty-five cents a tree if he cuts over twenty evergreen trees less than seven inches at the butt on land not his own. As the dealers have been paying little more than a cent apiece this license is intended to be prohibitive. There is apparently no reason why this law would not apply equally to trees cut for pulp or lumber, if they were under seven inches on the stump and cut by a lumberman simply owning the stumpage without the land. It is, of course, regrettable that the farmers have not been able to get more profit out of the Christmas tree industry.

A natural sequence of this law, and one which any lumberman might have foreseen, was a bill introduced by the legislative committee on conservation, providing that on certain sized tracts no spruce or hemlock trees under fourteen inches on the stump should be cut and no hardwoods under ten inches. Of course, no bill of such a nature could pass and it would

probably be proclaimed unconstitutional if passed, but it is regrettable that there is a tendency in such legislation to disregard entirely the experience of other nations which have had centuries of experience in dealing with this problem. No hard and fast rules can be laid down for forestry any more than for farming and any such rules are dictated only by ignorance of the subject.

One of the most interesting situations of the session arose over two bills introduced by the International Paper Company to allow the driving of pulp logs on two streams draining large forest areas owned by them in the mountains. There is, of course, no question but what this lumbering is to be done. The only question from a forestry standpoint is whether the company can be induced to practice forestry. The privilege of driving the logs to the mill would reduce the cost of transportation between $1.50 and $2.00 per cord. On a cut of ten cords per acre this would mean a big saving and, of course, a large inducement to the company to invest money in forestry, either planting or leaving seed trees. This company has shown a better disposition to practice forestry than any other concern in the state and offered in this bill to bond itself heavily to cut only under the direction of the state forester. Here was an opportunity of getting forestry practiced on 30,000 acres, but the opposition on the part of various business interests, probably including a railroad interested in the freight of the logs, and of summer residents who feared a disfigurement of the rivers, prevailed. It is to be hoped that the company will not retaliate by slashing their forests, which would probably have a worse effect on the stream; but may practice some forestry measures even without being required to do so.

Governor Proctor appointed four years ago a Conservation Commission of which Hon. Joseph A. DeBoer was the chairman. This Commission took an active part toward the creation of the state forester's office.

A second Conservation Commission was established by the past legislature, the members of which, appointed by Governor Mead, are President John M. Thomas of Middlebury College; Hon. C. P. Smith, Treasurer of the University of Vermont and State Agricultural College; and Colonel F. S. Billings of Woodstock. No appropriation was made for investigative purposes aside from the general funds available for the state geologist; the state forester; and the appropriation for an investigation by the United States Geological Survey of the water powers of the state.

The State Board of Agriculture and Forestry is made up as follows: Gov. John A. Mead, Chairman; Professor Joseph L. Mills, Director of the Experiment Station and Dean of the State Agricultural College, Secretary; and Hon. Clement F. Smith, Master of the State Grange. Governor Mead has traveled extensively in Palestine and other countries, where he has been impressed with the damage done by deforestation, and is a strong supporter of the state forestry policy.

The annual meeting of the Vermont Forestry Association was held in Burlington February 23. In the afternoon there was a business meeting, a talk on the forestry course in the Agricultural College by Professor J. L. Hills, and a discussion, opened by Austin F. Hawes, state forester, on state control of privately owned timber lands. In the evening there were addresses by Professor J. W. Toumey of the Yale Forest School, and others.

Nebraska

The Nebraska Conservation and State Development Congress held its second annual meeting in Lincoln, February 23rd and 24th. The program embraced a very broad and complete discussion of the state's resources and their development and the work of different agencies looking to that end.

The death of Prof. F. J. Phillips of the University of Nebraska, who committed suicide last month on account of despondency due to illness, is a loss to his profession and his associates. Professor Phillips was a young man who was doing a good work and doing it well.

North Carolina Forestry Association

The North Carolina Forestry Association was organized at Raleigh on the first of February with Dr. D. H. Hill of the North Carolina College of Agriculture and Mechanic Arts, president, and J. S. Holmes, state forester, secretary and treasurer. The association will open a general state campaign for better forest laws and their enforcement. An effort will be made to have instruction in forestry given in the public schools. An interesting program of practical papers on forestry subjects was presented at the meeting.

Northern Forest Protective Association

Thomas B. Wyman, forester of the Cleveland-Cliffs Iron Company, Munising, Michigan, has become chief forester of the new Northern Forest Protective Association, the organization of which has been previously noted in these pages.

To obtain the funds with which to carry out the forest patrol plan, which is a primary feature of the protective work, the directors have voted to levy an assessment of one-half cent an acre on the lands in the association, in addition to which each member pays a membership fee of $5. As there are now, approximately, 2,000,000

acres of land signed up, the amount available for the coming year's use will be about $10,000. It is expected that this amount will soon be doubled. The holdings of the present members of the association are fairly contiguous, being located principally in Alger, Marquette, Baraga, Houghton and Ontonagon counties, which makes the patrol much more feasible and less expensive than if the lands were widely scattered.

As fires broke out in March last year, an effort will be made to get things in readiness for actual work as soon as possible. The chief forester will engage a number of assistant foresters and patrols.

Protection from and precautions against forest fires, however, will not be the sole purpose of the association. A campaign of education will be conducted to impress upon the public the value of forest protection and conservation, not only to timber owners, but to the public at large. Homesteaders and campers will be taught to take precautions that will prevent fires, and the necessity of prompt action to quench them when once they get a start. No effort will be made to keep hunters and fishermen off, but the patrols will see to it all trespassers take timely precautions regarding fire and will endeavor to enforce the state laws.

Ohio State Forestry Society

The Ohio State Forestry Society held its seventh annual meeting at Columbus on Friday, February 3. The meeting was held in connection with the fourth annual national corn exposition, which brought together in the Ohio exposition buildings at Columbus noteworthy agricultural exhibits of thirty-five states. The exposition was open from January 30th to February 11th. There were some interesting forestry exhibits from the United States Forest Service, the Ohio Experiment Station at Wooster, and the Ohio State University. The most striking feature of the Forest Service exhibit was the model, first shown in the Appalachian exposition at Knoxville, showing the action of rainfall on wooded and denuded slopes. On one side of the model is a hillside covered with evergreen, and below in the level open country farm lands. On the other side is a bare gravelly hillside. A spraying arrangement with two arms produces rainfall on the two slopes. On our side the water runs off clear in the well-defined banks of a stream to a lake. On the other side the hill is suffering constant erosion, the stream that drains the area is muddy, with shifting bed and banks. Stones and silt are carried down and scattered along the banks and the lake, which furnishes the outlet, is muddy. The whole area is desolate and in striking comparison to that beside it. This model is an absolute reproduction of natural conditions and cannot fail to carry a most impressive lesson.

The state experiment station had an instructive exhibit, illustrating by photographs and by wood sections the conditions existing in Ohio. A great deal of interest was shown in these exhibits and the representatives of the station were kept busy explaining and giving practical talks to visitors throughout the day.

The meeting of the state forestry society Friday afternoon was held in one of the lecture rooms. The program began with an address by the President, Professor William R. Lazenby of Ohio State University, reviewing the work of the association and its problems. Following this Professor Bruce Fink of Miami University reviewed the subject of "Forestry at the Saint Paul meeting," bringing out the salient features of the forestry discussions at the Second Conservation Congress. Assistant Professor C. H. Goetz, who has recently come to Ohio State University from Washington, spoke on "Timber Waste of the Northwest." The speaker attributed the great waste in that section to greed for wealth and to transportation conditions. It is not a voluntary waste but is due to economic causes

Mrs. Clara Murdock of Akron, representing the Ohio Federation of Women's Clubs, spoke on "Unused Forces," showing the work done by the federated club women along all lines of effort, as an evidence of the great force here latent and ready to be used at need.

An interesting address followed on "County Forestry Societies" by George W. Miller of Bucyrus, president of the young but active Crawford County Forestry Society. County organizations play a considerable part in affairs in Ohio and the State Forestry Society proposes to organize branch societies in each county. Two counties, Crawford and Morrill, are already organized and Mr. Miller presented a very definite and well-conceived program for county work.

Edwin A. Start, executive secretary of the American Forestry Association, who was present, spoke of the work of that organization, its relation to the state work and the desirability of mutual understanding and close cooperation between the two bodies.

There was a general discussion of the work of the association. The following officers were elected: President, William R. Lazenby of Columbus; vice-president, W. J. Green of Wooster; secretary, J. J. Crumley of Wooster; treasurer, H. C. Rogers of Mechanicsburg; these, with George W. Miller of Bucyrus, to constitute an executive committee.

The state forestry work in Ohio has proceeded along lines peculiar to itself. The state was once covered with rich and varied forests, which have been almost entirely removed. Its great agricultural possibilities have been antagonistic to forestry and the forest needs and opportunities of the state have been disregarded or not understood, yet they are great and this is just

coming to be realized. Provision for the state work has been made in connection with the agricultural experiment station, so that this work has been and is entirely educational and experimental. This is well. It is gradually developing a solid groundwork of popular interest and understanding so that when the time is ripe for the development of a forest service and a complete state forest policy, there will be knowledge and popular support to make it effective and to prevent its being drawn into politics. Present indications are that the work that is being done is bearing good fruit.

Forest Fire Losses in California

Figures prepared by State Forester Homans show that during 1910 there were 738 brush, grass and forest fires in California, as against 638 for the same period of 1909. The excess for 1910 does not show an actual increase for the year, but greater efficiency in fire-fighting, asserts Deputy State Forester Hodge. In other words, wardens reported a greater percentage of the fires in 1910 than were reported the year previous.

Fires were of three clases, as follows: Small fires, put out by one man, 172; fires runing about ten acres, 25, and fires which gave considerable trouble, 351. The average fire burned over 654 acres of land and 326,000 feet of lumber, worth $814,000, besides damage to new growth and the watersheds. In other words, the average fire burned more than a section of land and took seventy-four men ten hours to extinguish.

The total number of acres burned over in 1910 was 482,562, against 357,269 in 1909; but again, Deputy Forester Hodge says, this is because the wardens reported more accurately last year than they did the year previous.

August, as in 1909, was the worst month of the year. During August 30 per cent of the fires occurred, and during July, the next worst month, 15 per cent of the fires occurred. It was on August 24th that the disastrous fires in Idaho and Montana were in full flame.

New York

Dr. Charles G. Wagner, superintendent of the Binghamton State Hospital, has just filed with the Forest, Fish and Game Commission an application for 3,000 white pine saplings, and trees of other varieties, making a total of 5,000, for planting on the hospital farm.

Two years ago the hospital got about 5,000 trees and last year about 3,000 more were added, both shipments being chiefly of white pine.

THE LUMBER INDUSTRY

Commissioner Smith's Report on Standing Timber

The first part of the report of investigations of the lumber industry by Herbert Knox Smith, commissioner of corporations, has been submitted to the President, under date of February 13. This part of the report deals with standing timber. It is quite fully summarized in Mr. Smith's letter of submittal to the President. In this letter Mr. Smith says:

The foremost facts shown are:

(1) The concentration of a dominating control of our standing timber in a comparatively few enormous holdings, steadily tending toward a central control of the lumber industry.

(2) Vast speculative purchase and holding of timber land far in advance of any use thereof.

(3) An enormous increase in the value of this diminishing natural resource, with great profits to its owners. This value, by the very nature of standing timber, the holder neither created nor substantially enhances.

These are the underlying facts, of tremendous significance to the public welfare. They are primarily the results of our public-land policy, long continued. The laws that represent that policy are still largely operative. The past history and present status of our standing timber drive home upon us the imperative necessity of revising our public policy for the future management of all our remaining natural resources. That history is here outlined.

FROM GOVERNMENT TO PRIVATE OWNERSHIP.—Only 40 years ago at least three-fourths of the timber now standing was (it is estimated) publicly owned. Now about four-fifths of it is privately owned. The great bulk of it passed from government to private hands through (*a*) enormous railroad, canal, and wagon-road grants by the Federal Government; (*b*) direct government sales in unlimited quantities at $1.25 an acre; (*c*) certain public-land laws, great tracts being assembled in spite of the legal requirements for small holdings. Such laws were wholly inappropriate to forest regions; but, though vigorously condemned in several public reports, they are still largely in force. In theory, they were intended to distribute the public lands in small tracts as homes

for freeholders. In fact, they actually furthered timber concentration in vast holdings. The 1,802 largest holders of timber now own 88,579,000 acres of land, as compared with a vastly wider distribution of public lands in non-timbered agricultural sections.

During this interval, and chiefly in the latter half thereof, the value of standing timber has increased tenfold, twentyfold, and even fiftyfold, according to local conditions. The present annual growth is only about one-third of the present annual cut. Replacement by new growth is very slow.

Examples of the increase during this interval are: From $5 to $30 an acre, $7 to $40, $20 to $150, $1 to $13, $4 to $140, $1 to $50. Specific tracts have been sold first for $24,000, and later for $153,000; $10,000, and later $124,000; $240,000, and later $2,500,000; $23,000, and later $500,000; $19,000, and later $1,125,000. These examples illustrate the remarkable profit made by certain individual holders.

What did the government get for the timber? Of the southern pine sold for $1.25 an acre, much is now worth $60 an acre. Large amounts of Douglas fir in western Washington and Oregon, which the government gave away, or sold at $2.50 an acre, now range from $100 to $200 per acre. The great redwood belt in California was alienated on similar terms, and some of it is now worth hundreds of dollars an acre. Practically none of the great forests in the public-land states was sold by the government for more than $2.50 an acre. The great increase of value gives grave importance to the concentration of ownership.

The former Chief of Field Service of the General Land Office, H. H. Schwartz, stated officially (1909) that the Timber and Stone Act—

"has resulted in the sale of over 12,000,000 acres of valuable timber lands, of which fully 10,000,000 acres were transferred to corporate or individual timber-land investors by the entrymen. These lands brought to the people or general government a gross sum of $30,000,000. At the date of sale they were reasonably worth $240,000,000. The profit of over $200,000,000 went not to the needy settler engaged in subduing the wilderness, but to the wealthy investors. Not over a fractional part of 1 per cent of the timber purchased from the United States under this act is held, consumed, or even cut by the men and women who made the entries."

An effective illustration of what has happened under our land laws appears in the report of the United States Forester for 1910:

"An investigation emphasizes the probability that heavily timbered lands, if opened to entry, would pass into the hands of large owners of timber. Of 705,000 acres eliminated from the Olympic National Forest in 1900 and 1901 on the ground that the land was chiefly valuable for agriculture and that the settlement of the country was being retarded, 523,720 acres passed ultimately into the hands of owners who are holding it purely as a timber speculation. Three companies and two individuals own over 178,000 acres, in holdings of from 15,000 to over 80,000 acres each. Of timbered homestead claims on this eliminated area, held by 100 settlers, the total area under actual cultivation is only 570 acres, an average of but 5.7 acres to each claim. It will be seen that the original purpose of the elimination was defeated, and the bona fide settlement was not materially advanced."

CONTROL OF THE TIMBER CONTROLS THE WHOLE INDUSTRY.—Whatever power over prices may arise from combinations in manufacture and distribution (as distinguished from timber owning), such power is insignificant and transitory compared to the control of the standing timber itself or a dominating part thereof. The Senate and House resolutions, to which this investigation is responsive, ask for the causes of the high prices of lumber and the effect of combination upon such prices. The resolutions, therefore, required determination of both the amount and the control of standing timber.

AMOUNT OF STANDING TIMBER.—There is now left in continental United States about 2,200 billion board feet of privately owned standing timber, of which 1,747 billion is in the "investigation area," covered in great detail by the Bureau. This area includes the Pacific-Northwest, the Southern Pine Region, and the Lake States, and contains 80 per cent of all the private timber in the country. In addition, there are about 539 billion feet in the national forests and about 90 billion feet on other nonprivate lands. Thus, the total amount of standing timber in continental United States is about 2,800 billion board feet. The present annual drain upon the supply of saw timber is about 50 billion feet. At this rate the timber now standing, without allowance for growth or decay, would last only about 55 years.

The present commercial value of the privately owned standing timber in the country, not including the value of the land, is estimated (though such an estimate must be very rough) as at least $6,000,000,000. Ultimately the consuming public will have to pay such prices for lumber as will give this timber a far greater value.

This is the first comprehensive and methodical investigation of the amount and ownership of our standing timber. It rests on the best information obtainable from records of timber owners or the knowledge of men in the industry, information which daily forms the basis of actual business dealings. (A physical canvass of the forests was out of the question.) The data, collected by field work in about 900 coun-

ties, assembled, mapped, checked, and weighed in the office, are reliable within a relatively small margin of error. All figures relate to merchantable saw timber, in terms of lumber yield. The unit "board foot" is a foot square and an inch thick.

CONCENTRATION OF TIMBER OWNERSHIP.—Three vast holdings alone, the greatest in the country, those of the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company (including their subsidiary companies), together have 238 billion feet, or nearly 11 per cent of all our privately owned timber. They have 14 per cent of that in the "investigation area." With the five next largest they have over 15 per cent of the total privately owned timber and over 19 per cent of that within the investigation area. Finally, nearly one-half (48 per cent) of the private timber in that area is held by only 195 great holders. The term "holder" covers any single interest—individual, corporate, or group—which is so united as to be under one control.

The Pacific-Northwest.—Five-elevenths of the country's privately owned standing timber is in the Pacific-Northwest (California, Oregon, Washington, Idaho, and Montana), 1,013 billion feet. One-half of this is now owned by 37 holders; many of these are closely connected. The three largest holders (named above) alone have nearly one-quarter. This section now furnishes only one-sixth of the annual cut. Thus its timber is being largely held for the future, and the large owners there will then be the dominating influence in the industry.

The Southern Pacific Company holding is the greatest in the United States—106 billion feet. This is about 6 per cent of the private timber in the investigation area, and 10 per cent of that in the Pacific-Northwest. It is difficult to give an adequate idea of its immensity. It stretches practically 680 miles along that railroad between Portland and Sacramento. The fastest train over this distance takes 31 hours. During all that time the traveler thereon is passing through lands a large proportion of which for 30 miles on each side belongs to the railroad, and in almost the entire strip this corporation is the dominating owner of both timber and land.

The second largest holder is the Weyerhaeuser Timber Company (including its subsidiary companies), with 96 billion feet. This does not include further very extensive timber interests of the Weyerhaeuser family and close associates.

These two holdings would supply the 46,584 sawmills in the country for four and two-thirds years. They have one-eleventh of our total private timber.

The third largest, the Northern Pacific Railway Company, has 36 billion feet.

These three holdings have enough standing timber to build an ordinary 5 or 6 room frame house for each of the 16,000,000 families in the United States in 1900. If sawed into lumber and placed in cars, their timber would load a train about 100,000 miles long.

The holdings of the two railroad companies are government grants, and 80 per cent of the Weyerhaeuser Timber Company holding was bought from the Northern Pacific grant. Many other large holdings (here and in other regions) were mainly purchased from some land grant.

Southern Pine Region.—In the Southern Pine Region there are 634 billion feet of privately owned timber. Concentration in total timber is much less than in the Pacific-Northwest. There is, however, a high concentration in the more valuable species, longleaf yellow pine and cypress. Sixty-seven holders own 39 per cent of the longleaf yellow pine, 29 per cent of the cypress, 19 per cent of the shortleaf and loblolly pine, and 11 per cent of the hardwoods.

The Lake States.—In Minnesota, Wisconsin, and Michigan there are 100 billion feet of privately owned timber. In Wisconsin 96 holders have three-fourths of all the timber. In Michigan 113 holders have 66 per cent. In Minnesota 6 holders have 54 per cent of the very valuable white and Norway pine, 16 per cent of the other conifers, and 2 per cent of the hardwoods. Taking all three states, 215 holders have 65 per cent of all the timber.

EFFECT OF CONCENTRATION.—Such concentration in standing timber, if permitted to continue and increase, makes probable a final central control of the whole lumber industry. A few strong interests, ultimately holding the bulk of the timber, can set the price of timber and its products. The manager of the National Lumber Manufacturers' Association recently said to lumbermen on the Pacific coast:

"The day of cheap lumber is passing and soon will be gone, but the men who make the money will be those who own timber and can hold it until the supply in other parts of the country is gone. Then they can ask and get their own price."

Certain further factors, not exactly measurable, increase still more the real concentration. First, a further interweaving of interests, corporate and personal, connects a great many holdings which the Bureau has treated as separate; second, there are very large totals of timber so scattered in small tracts through larger holdings that they are substantially "blocked in" or "controlled" by the larger holders; third, the concentration is much higher in the more valuable species.

General information obtained indicates a very high concentration in timber ownership outside the investigation area.

POLICY OF GREAT HOLDERS.—The largest holders are cutting little of their timber. They thus reserve to themselves those incalculable profits which are still to accrue with the growth of the country, the diminishing of timber supply, and the further concentration and control thereof. Many of the very men who are protesting against conservation and the national forest system

because of the "tying up" of natural resources are themselves deliberately tying them up far more effectively for private gain.

The fact that mature timber is thus withheld from use is clear evidence that great additional profits are expected to accrue through further increase in value.

LAND MONOPOLY.—Standing timber is not the only question. When the timber has been cut the land remains. There has been created, therefore, not only the framework of an enormous timber monopoly, but also an equally sinister land concentration in extensive sections. This involves also a great wealth in minerals. The Southern Pacific has 4,318,000 acres in northern California and western Oregon, and, with the Union Pacific, which controls it, millions of acres elsewhere. (The government, however, is now suing to annul title to the Southern Pacific lands in Oregon for non-compliance with the terms of the original grants.) The Northern Pacific owns 3,017,000 acres of timber land and millions more of non-timbered land. The Weyerhaeuser Timber Company owns 1,945,000 acres. In Florida, five holders have 4,000,000 acres, and the 187 largest timber holders have over 15,800,000 acres, nearly one-half the land area of the State. In the whole investigation area the 1,802 largest holders of timber have, together, 88,579,000 acres (not including Northern Pacific and Southern Pacific lands in non-timbered regions); which would make an average holding of 49,000 acres, or 77 square miles.

Finally, to timber concentration and to land concentration is added, in our most important timber section, a closely connected railroad domination. The formidable possibilities of this combination in the Pacific-Northwest and elsewhere are of the gravest public importance.

THE FUTURE.—These are the facts of the lumber business in its most important feature, the natural supply. The paramount consideration remains still to be stated. There are many great combinations in other industries whose formation is complete. In the lumber industry, on the other hand, the Bureau finds now in the making a combination caused, fundamentally, by a long-standing public policy. The concentration already existing is sufficiently impressive. Still more impressive are the possibilities for the future. In the last 40 years concentration has so proceeded that 195 holders, many interrelated, now have practically one-half of the privately owned timber in the investigation area (which contains 80 per cent of the whole). This formidable process of concentration, in timber and in land, certainly involves grave future possibilities of impregnable monopolistic conditions, whose far-reaching consequences to society it is now difficult to anticipate fully or to overestimate.

Such are the past history, present status, and apparent future of our timber resources. The underlying cause is our public-land policy, resulting in enormous loss of wealth to the public and its monopolization by a few interests. It lies before us now as a forcible object lesson for the future management of all the natural resources still remaining in the hands of the government.

Hardwood Manufacturers' Association

The Hardwood Manufacturers' Association held a great meeting at Cincinnati, January 31st and February 1st. The administration of President Carrier has been most successful. In his annual address Mr. Carrier referred to the alarming decrease in the hardwood supply shown by government statistics, verified by the association, as meaning "constantly increasing values of stumpage, with little hope of practical reforestation—a condition the gravity of which must be recognized by every operator."

The report of the secretary, Lewis Doster, gave the amount of lumber shipped in 1910 by members of the association at 659,022,000 feet.

W. B. Townsend presented a report for the committee on forest conservation, in which he said that the subject was many sided, and in the current discussion of it too much ill-feeling and slander had been stirred up to accomplish the maximum of public good at the minimum expense. He alluded to the forests still remaining in Oregon and in the South from Maryland to Texas as refuting the pessimist who is constantly crying "Wolf! wolf! where there is no wolf and, who, with sanctimonious air and grieved expression, claims that with present methods of manufacture—which he calls destruction—we will have no standing timber left in a decade." He took up the question of forest fires and criticised severely the expenditure of its funds under a former chief, claiming that of its $20,000,000 vast sums had been used to employ and pay lecturers, etc., which should have been used to provide fire protection. In closing, he said: "The costly lessons of this year I trust will result in substituting practical for theoretical methods—for it surely has been demonstrated that lectures, editorial, or news articles cannot stop the ravages of a forest fire. I am glad to note a change along these lines, and I believe we may expect very material improvements from the present administration of this important department of our government." A vote was taken endorsing the sentiments expressed by Mr. Townsend.

In his comments on the pessimist, Mr. Townsend seems to have hit President Carrier, for the latter's statement in his annual address regarding the hardwood supply certainly challenged Mr. Townsend's confidence in our security. In regard to his criticisms of expenditure by the Forest Service Mr. Townsend seems to have got his inspiration from the article by Senator Carter of Montana, which was given so much publicity last autumn. The

carelessness and injustice of this article were clearly shown in an editorial in AMERICAN FORESTRY for December, 1910. We do not care to traverse the ground now, but in view of the fact that Senator Carter's article has evidently been taken seriously in a quarter that should have been better informed, we call attention to two facts—the restriction put by Congress upon the manner of expending the appropriations, and the comparatively insignificant amount which was really expended for lectures, and for the necessary educational work done by the department. It will be worth while for members of the Hardwood Manufacturers' Association to read the article referred to in connection with Mr. Townsend's report. It is on page 735 of this magazine for December, 1910.

A resolution adopted by the association approved and promised support to the Forest Products Laboratory at Madison, Wisconsin, called the attention of the University of Wisconsin to its great opportunity for establishing a school of forest utilization, and urged upon Congress the need of developing more highly the work of this branch of the Forest Service to enable it "to take up at once the many vital problems now confronting the lumberman, the solution of which will result in such great benefit to the whole nation." Another resolution opposed the reciprocity agreement with Canada on the ground that it singles out for reduction of tariff the products of the soil, both forest and agricultural.

The officers and executive board elected are: President, W. B. Townsend; vice-presidents, W. E. Delaney and C. E. Ritter; treasurer, C. M. Crawford; R. M. Carrier, Clinton Crane, W. A. Gilchrist, F. F. Fee, J. H. Himmelberger, C. H. Lamb, John W. Love, G. M. W. Buehrmann, J. W. Oakford, A. B. Ransom, W. M. Ritter, R. H. Vansant, William Wilms. There were also chosen an executive grading commission of fourteen, twenty-one state vice-presidents, and state directors for seventeen states. The attendance was 368, the largest in the ten years' history of the association.

Northern Hemlock and Hardwood Manufacturers

The Northern Hemlock and Hardwood Manufacturers' Association held its second annual meeting in Milwaukee, January 31. Among other subjects in his annual report, the secretary, R. S. Kellogg, discussed the need of more complete utilization of product, declaring that there are possibilities yet undreamed of in all kinds of timber. Referring to the work already done by the United States Forest Service and the University of Wisconsin, he asked why the state of Wisconsin should not be requested to provide at the university a school of forest utilization, where men can be technically trained in the manufacture of forest products. On this point he said: "The laboratory studies, investigates, invents and discovers. The school teaches men how to apply scientific principles to the problems of production. Wisconsin has no need for a school in which to train foresters: there are plenty of such schools already in existence, from the Atlantic to the Pacific. They should be strengthened and made more efficient, not weakened, through the multiplication of small schools. But there is no college or university in Wisconsin or in any other state to which we can send a man for thorough instruction in the manufacture of forest products. The forestry schools teach us how to grow timber. Is it any less important that we should be taught how to utilize it? It is likely that the present session of the legislature will be asked to establish a forest school at the university. Should we not grasp the opportunity before it is too late to secure instead the school that is by far the most needed, a school of forest utilization? Would it not be well for us to have our legislative committee present this view to the governor, the legislature and the university, and for us to ask other state organizations to join us in our efforts to make the most of our timber resources?"

Thornton A. Green reported for the forest fire committee, reviewing the work of the Lake States Forest Fire Conference and the formation of the Northern Forest Protective Association.

William L. Hall, chief of the division of products of the United States Forest Service, made a comparison between the increase in population and the increase in lumber production which was enlightening. He said: "In 1880 the lumber production was 18,000,000,000 feet. In 1890 the increase was 31.5 per cent. In the decade from 1890 to 1900 the increase was 47 per cent, and between 1900 and 1910 the increase was 27 per cent, representing a production of 44,484,000,000 feet. The total gain in these thirty years was 146 per cent. The population of the country in 1880 was 50,000,000; in 1890 it was 63,000,000, representing a growth of 25.5 per cent, and in 1900 it was 76,000,000, showing a growth of 21 per cent; and in 1910 it was 92,000,000, showing an increase of 21 per cent. The total increase in population for the thirty years has been 83 per cent, as against 146 per cent for the increase in lumber production.

Sawmill capacity apparently has also increased to a large extent. We do not know how much the capacity of the mills exceeded actual production in previous decades. Taking the figures for 1909, I have studied this subject with reference to two states, Louisian and Washington. In Louisiana 383 mills out of a total of 658 reported their capacity as well as their actual production. In that state actual production amounts to only 62 per cent of the rated capacity of the mills. In the state of Washington the actual production was somewhat lower, amounting to 51 per cent of the capacity of the mills. With such a margin of capacity over actual production it is easy to see how strong is the tendency toward increase of production.

The plants are upon the ground, the operations are all laid out. It is perhaps just as easy to produce 75 percent of the nominal capacity of the mills as it is to produce 50 percent. Of course, the industry, on this account, will respond to every improvement in market conditions with an unnecessarily large increase in production unless there be a sufficiently strong control of production to prevent it, and that control the figures clearly show to be lacking."

Officers elected were: President, W. C. Landon; vice-president, M. P. McCullough; treasurer, George E. Foster; secretary, R. S. Kellogg; directors, W. O. Brightman, George H. Atwood, T. A. Green, and R. E. McLean.

Pennsylvania Lumbermen's Association

At the nineteenth annual meeting of the Pennsylvania Lumbermen's Association in Philadelphia, Thursday, January 26, the association's forestry committee reported, through its chairman, J. S. Hess, as follows:

The crusade for the conservation of our natural resources received a strong impetus during the administration of President Roosevelt. The necessity for the conservation of the forests of the United States for the proper use of them by the present and future generations of American citizens was brought to the attention of the whole country. No class of people more faithfully seconded the movement than the lumbermen of the United States. At all meetings of lumbermen during the last decade the subject received their earnest attention, but agitation without action that will tell is of no avail.

As Pennsylvanians we may well be proud of what our state is doing in the direction of conservation and reforestation. Nearly 1,000,000 acres are now in the possession of the state and no forestry department of any state has done more effectual and systematic work than our own great commonwealth. The forestry department has quietly gone forward with the work so nobly begun by Professor Rothrock, and so ably continued by the men at the head of the department today. New forest reserves are being added as the means afford, and men are at work sowing seeds and preparing seedlings for the replanting of the state forest reserves and the private forest lands in the state. Our state is engaged in the education of young men for the work of forestry and the management not only of our state reserves but also of the forest land owned by private individuals.

From an article in the Public Ledger I gleaned the following:

"Although the scientists of the federal and of some state governments have long recognized the growing danger in the rapid spread of the chestnut blight, Pennsylvania is the only state which has organized a thoroughly systematic study of the disease and applied practical methods to check its spread."

Seeing what the forestry department is doing with the small amount of money appropriated, our association should join with the friends of forest conservation in urging larger appropriations by the legislature to further and continue the great work so nobly done with the limited means at their command.

The national government has been spending a large amount of money in the maintenance of national forest reserves in the West. An equal amount should most justly be spent in the acquisition and maintenance of similar national forest reserves in the South and East. The national reserves in the West amount to 194,505,325 acres. They are cared for by 1,500 national forest officers. The total expenditure during the last year was $3,908,249. They yield a revenue, but as the larger proportion goes to the states in which they lie the actual expense of maintenance is paid for by the whole country. The states in which the national forest reserves are situated are Arizona, Arkansas, Oklahoma, Colorado, Florida, Idaho, Kansas, Minnesota, Michigan, Montana, Nebraska, Nevada, New Mexico, North Dakota, California, Oregon, South Dakota, Utah, Washington and Wyoming. Not one of the original thirteen states, not one of the states that fought the war of 1812, not one of the states that assisted in the purchase of Florida or the Louisiana country, not one of the states with the exception of Florida that fought the Mexican war ever received a dollar for the conservation of forest lands from the national treasury.

The extensive forest reserves in the West were taken out of the national domain and paid for by the whole country. Common justice would dictate that the South and East should also be taken care of. The West is seeking further expenditure on the part of the national government for the irrigation of her arid lands. If the national treasury should provide for the conservation of the forests of the West, then also should the national government assist in the establishment of national forest reserves in the Appalachian range in the eastern part of the United States.

We lumbermen and other citizens of the East should join in this appeal for simple justice and equity. The two things needed then are: 1. An appeal to the legislature for further appropriations to the state forestry department for the efficient prosecution of the work so well begun. 2. An appeal to the Congress of the United States for our Appalachian forest reserve.

The officers were reelected: President, Henry Palmer of Langhorne; vice-president, F. S. Pyfer of Lancaster; treasurer, T. J. Snowden of Scranton; secretary, J. Frederick Martin of Philadelphia.

Adopted by the Cornell Forestry School

Every Forestry Library Should Own at Least One Copy of

Trees and Their Life Histories

By PROFESSOR PERCY A. GROOM, M.A., D.S.C., F.L.S.

(Cantab. et Oxon.)

The Most Superbly Illustrated Tree Book Ever Issued. ¶ With 512 Reproductions of Photographs of Trees by Henry Irving, the Result of Years of Study

ACCURATE, THOROUGH, READABLE

THIS exceptionally complete and magnificently illustrated work is meeting with the highest commendation and approval from the numerous Tree authorities and Forestry students who are acquainted with it. Numbers of our Forestry School Libraries have already purchased it. It is pre-eminently a work for Nature Lovers, practical Tree Experts and students of Tree Life.

Analytical tables, diagnoses of families, and numerous illustrations, together with a brief mention of distinctive features, enable the reader to identify each of the seventy-five varieties of trees that are here fully treated.

Particular trees have been selected for more detailed discussion. For example, branching of the tree is specially illustrated by the Larch, Yew, Horse Chestnut, and others; branching of a shrub and weeping tree, by the Elder and Laburnum; the repair of injuries, by the Scots Pine; the shape and conduct of a light-demanding tree, by the Larch and Birch; the degeneration of flowers, by the Sweet Chestnut and Ash. And so on.

A MARVEL OF ILLUSTRATION

Mr. Henry Irving has been engaged for a number of years in making an exhaustive series of photographs of Trees, a field in which he is acknowledged by leading nature photographers without a peer. The finest results of his work are embodied in Professor Groom's

"TREES AND THEIR LIFE HISTORIES"

This book contains over one hundred large plates and four hundred smaller ones, showing each tree in its summer and in its winter appearance, also of each tree the trunk and bark, the bud and twig, the leaf spray, the flower spray, and the fruit cluster. Neither pains nor expense have been spared to make the illustrations, as they have never before been done, complete, typical, and true to nature.

The work is a large Octavo, printed with great care on the finest quality surface paper and strongly bound in green silk cloth and gold.

Price, $10.00 Net, Sent on Approval

LET US SEND YOU THIS VOLUME WITH THE UNDERSTANDING that should it fail to substantiate all our claims, you may return it to us by Express Collect. We will in this case refund you the full amount of remittance upon the arrival of the volume in good condition.

CASSELL & COMPANY

Established 1848

43-45 East Nineteenth Street

NEW YORK

Tear off and mail this Coupon to

Cassell & Company, 43-45 East 19th St., New York.

Gentlemen:

Find enclosed $10.00 (check, money order, or currency), for which please send me, carriage paid, 1 copy of "TREES AND THEIR LIFE HISTORIES," by Professor Percy Groom. I reserve the privilege of returning the volume to you if unsatisfactory, and if I should, you agree to refund me at once the full amount of my remittance.

NAME.....

ADDRESS.....

.....

YALE FOREST SCHOOL

NEW HAVEN, CONNECTICUT

The course of study in the YALE FOREST SCHOOL covers a period of two years. Graduates of collegiate institutions of high standing are admitted as candidates for the degree of Master of Forestry.

The Summer Term is conducted at
MILFORD, PIKE COUNTY, PENNA.

FOR FURTHER INFORMATION ADDRESS

JAMES W. TOUMEY, Acting Director
New Haven Connecticut

GET THE CHAUTAUQUA IDEA

Don't read at random. Read a definite course. Train your attention upon a group of related topics. Learn about "Democratic England" this year. A reading set of Magazine-teacher and four books, complete in itself. Four such courses of the Chautauqua cycle, read in spare minutes, will give the college outlook, renew the early vision of liberal culture, bring that comprehensive understanding of world movements which makes for personal efficiency. Course neither difficult nor expensive. Begin NOW.

For particulars address Dept.

CHAUTAUQUA INSTITUTION
Chautauqua, New York.

Learn About England

BILTMORE FOREST SCHOOL

Biltmore, N. C.

Theoretical and practical instruction in all branches of applied forestry.

The course comprises eighteen months; viz: twelve consecutive months of lectures and field work and six months of practical professional Working fields in the Southern Appalachians, in the Lake States and in central Germany.

Catalogue upon Application

Dr. C. A. SCHENCK, Director

JAMES D. LACEY WOOD REAL VICTOR THRANE

ARE YOU

Interested in SOUTHERN or PACIFIC COAST Timber?

We furnish detailed reports as to the QUALITY of the timber, average lengths and number of trees on each 40-acre subdivision.

We submit reports covering details as to logging conditions, cost and most feasible methods of logging each 40-acre or sectional subdivision of each tract.

We also furnish a TOPOGRAPHICAL map of all tracts located in mountainous districts, showing every elevation of 100 feet throughout the tract with OUR OWN engineer's report showing locations of most feasible routes and grades for logging roads.

We can furnish sufficient data regarding ANY tract of timber which we have examined to convince you whether the tract is just what you want or not. Personal inspection of any tract we may offer you will be found just as represented.

We are in a position to offer some exceedingly attractive TIMBER properties in the SOUTH, in BRITISH COLUMBIA, and on the PACIFIC COAST. Also a few going mill operations with ample timber supplies in the South.

We furnish detailed reports of amount of STUMPAGE on each 2 1-2- 5- or 10-acre subdivision of each forty.

We employ expert PACIFIC COAST CRUISERS to check all estimates made on Western Timber.

We offer HIGH-CLASS Timber Properties only, which have been placed in our hands for sale.

We can convince you that our estimates are reliable.

JAMES D. LACEY & CO.

(ESTABLISHED SINCE 1880)

1311 Whitney Central Bldg.	1104 Spalding Bldg.	1006 White Bldg.	1218 Old Colony
New Orleans	Portland, Ore.	Seattle	Chicago

NATIONAL CAPITAL PRESS